

# THE IRON AGE

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## X-Raying Die Castings

**R**ECENT X-ray studies of die-cast test bars<sup>1</sup> have shown that the interior conditions depend largely upon the construction of the die. This was emphasized also in a recent paper<sup>2</sup> by the users of X-ray equipment in production and inspection work. Some time ago<sup>3</sup> one of the authors made a brief statement on the application of X-ray inspection and since that time this method has made rapid and successful progress.

### Three Methods of X-Ray Examination

In examining die castings by means of X-rays we are concerned with three ways to do this:

- 1.—Radiographic inspection with photographic film.
- 2.—Radiographic inspection with photographic paper.
- 3.—Visual inspection on a fluorescent screen.

Radiographic inspection with photographic film is the most sensitive way to obtain a permanent record and likewise the most

### Locating Defects Before Production— Three Methods of Examination—Technique of the Process—Concrete Cases

BY DR. ANCEL ST. JOHN AND H. R. ISENBURGER\*

castings which are less transparent to X-rays than aluminum castings, since the atomic weight of zinc is so much higher than that of aluminum and the penetrating power of X-rays decreases with increasing atomic weight.

Where a longer exposure time can be tolerated, the less expensive method of radiographic inspection with bromium-silver paper is satisfactory, especially for aluminum castings. Besides being a slower method of inspection, there are not as many details obtainable as with films, though the permanent record can be secured.

rapid of these three, but it is the most expensive one. It shows defects which will not show up on the photographic paper nor on a fluorescent screen. This holds specially true for zinc-base die

### Technique of the Methods

The technique for both these methods is schematically shown in Fig. 1. The objects under investigation (B) are placed between the focus (X) of an X-ray tube and as close as possible to the photographic film or paper (F). The tube is mounted within a lead-lined steel



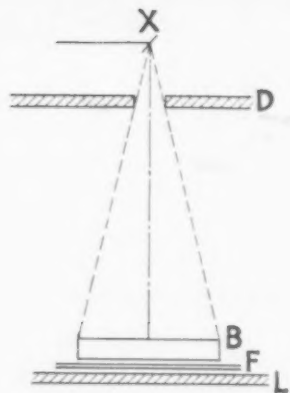
X-Raying a Zinc-Base Die Casting

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<sup>1</sup> *Proceedings, Amer. Soc. for Testing Materials*, Vol. 29, Part I, p. 200, 1929.

<sup>2</sup> "Radiography as a Tool in the Metal Industry," by W. L. Fink and R. S. Archer, Aluminum Co. of America, Cleveland convention of the Am. Soc. Steel Treating, Sept. 10, 1929.

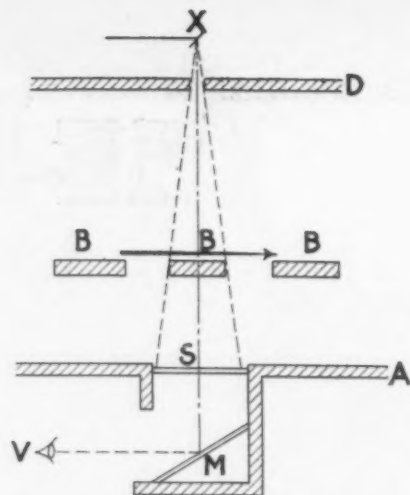
<sup>3</sup> "Applied X-Rays in the Metal Industry," by Herbert R. Isenburger, *The Metal Industry*, June, 1928.



X—Focus of X-Ray tube  
D—Lead-covered steel drum  
B—Specimen under investigation  
F—Film  
L—Lead backing

FIG. 1.—Technique of Photographic Film Method of X-Ray Examination (Left)

Fig. 2—Technique of the Fluoroscopic Method of Inspection (Right)



X—Focus of X-ray tube  
D—Lead-lined steel drum  
B—Objects under investigation  
S—Fluorescent screen  
A—Lead shields  
V—Viewer  
M—Lead glass mirror

drum (D) to prevent the escape of X-rays except through predetermined openings; the film or paper is protected against secondary radiation by a rather heavy lead backing (L).

The appearance of the various defects is almost the same for different materials and can be raised up to 1 per cent precision in radiographic inspection with film record, to about 2 per cent with bromide paper record and to not better than 4 per cent in visual inspection with fluorescent screen. This holds good for blowholes which lie in the direction of the rays.

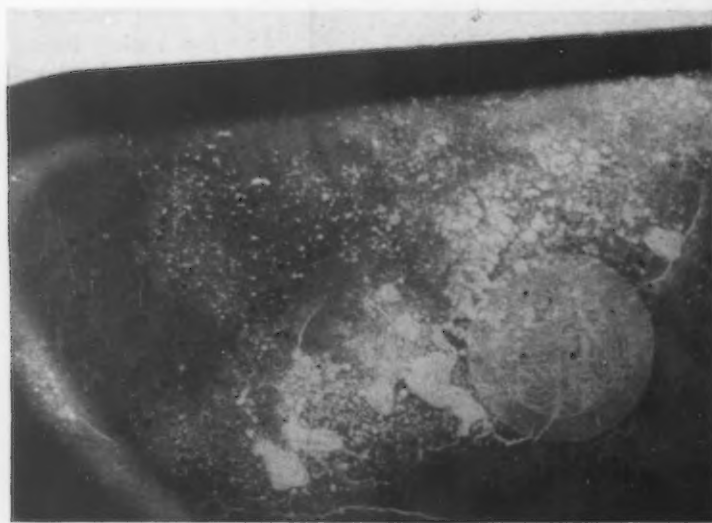
Visual inspection is mostly employed for checking up on production and is of special value where die castings are supplied on a certain permissible percentage of poros-

ity. This method is rapid but relies on the momentary judgment of the operator and there is no permanent record. Fig. 2 illustrates the fluoroscopic inspection. As in Fig. 1 (B), are the objects to be examined which can be arranged on a slowly moving conveyor belt, if desired, (X), the focus and (D) the drum. After having passed through the specimen, the X-rays excite a barium platino-cyanide screen (S) to an effective fluorescence radiation which is observed in a lead glass mirror (M) by the viewer (V); (A) represent protecting lead shields against stray radiation. The visual inspection of an aluminum propeller is schematically shown in Fig. 3.

It will be noticed in the illustration that the lightest spot on the screen corresponds with the thickest part on

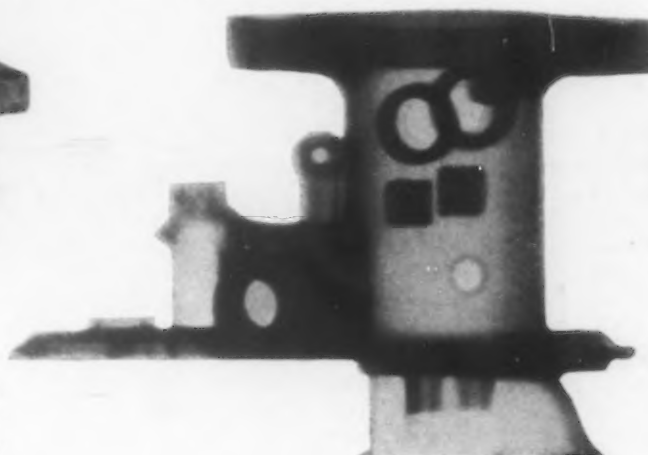
FIG. 4.—X-Ray Picture of Part of an Aluminum Cooking Utensil (Below)

Fig. 5.—Portion of the Side Wall of Loud Speaker Case (Zinc-Base Die Casting) Under the X-Ray (Right)





**FIGS 6 and 7.—A Perfect Die Casting and Its Appearance Under the X-Ray**



the propeller. If the same propeller had been X-rayed on a photographic film and a print had been made, the very same region which appears light on the screen would be the darkest in the print. As with ordinary photographs, lighter regions on the negative (fluorescent screen) or darker regions on the print mean that less X-rays have passed through the object at that point which indicates that the object is less transparent there. Hence cavities will show up in the prints as light spots whereas heavy impurities or more dense metal will appear darker. With this in mind there should be no difficulty in understanding the following X-ray pictures.

#### X-Ray Pictures of Castings

Fig. 4 depicts an aluminum cooking utensil, submitted for examination because suspected. It is an excellent example of what a die casting should not be. Besides numerous cracks, there are large gas pockets and considerable general porosity, the latter showing the flow of the metal itself. A part of the side wall of a loud-speaker case (zinc-base die casting) is illustrated in Fig. 5. In addition to general porosity, the darker area indicates denser metal, the white spots are gas bubbles, the dark spot in the lower half is an impurity and the line through the center represents the parting line in the die. The number T-7650001 is cast in. Fig. 6 shows what can be done with proper casting technique: A perfect zinc casting, photographed in Fig. 7.

#### Detecting Defects Before Production

Defects in die castings arise principally from two causes: (1) Incorrect specification of die casting procedure. (2) Departure from specified procedure. The former leads to characteristic or chronic defects, the latter to occasional.

In order to improve the quality of die-cast products the following procedure should be adopted: Select at least three specimens cast in the same die and X-ray these. Any defects characteristic of the casting technique will be likely to appear in all three pictures. In comparing the pictures with the die, die casting engi-

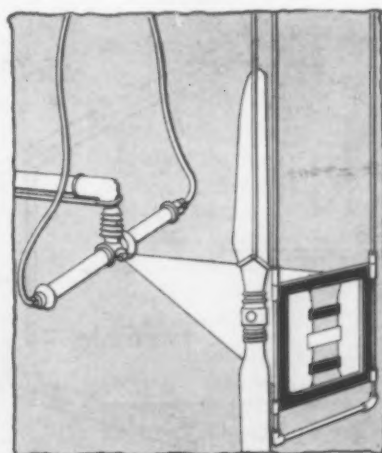
neers are able to find easily the causes for interior defects. The necessary changes in form or position of gates and air vents or other parts of the die, such as can be made without requiring new dies, are determined and made. Have another group of castings, made by the new technique, X-rayed, and proceed in this way until satisfactory castings can be secured from the die. It should not take more than two X-ray examinations in order to obtain a perfect die.

This procedure should be especially applied to pilot castings before a new die is put into production operation. In most of the cases where X-ray inspection has been employed, it has proved cheaper and ever so much more satisfactory, in saving time and money, than the ordinary and old-fashioned way of cutting up castings and all similar ways of checking production. The X-ray picture shows the conditions throughout the piece without destroying or in any way harming it and gives a permanent record.

After defective conditions are corrected once, they tend to stay corrected.

X-ray equipment, however, should not be installed until the problems in hand justify the purchase of an outfit. This would seem to make the tool unavailable to the organization with a small problem or a temporary difficulty. But, fortunately, some of the pioneers have installed equipment to take care of such cases, so that it is possible to evaluate any proposed use of X-rays without great expense.

It is believed that the advantages to be gained in the field here discussed, as well as in other branches, particularly in steel castings, will justify present necessary expense in some cases. There are reasons to expect, however, that operating costs can be reduced by efficient methods.



**FIG. 3—Schematic Plan of Visual X-Ray Inspection of an Aluminum Propeller**



# Foundry Operates Production Units

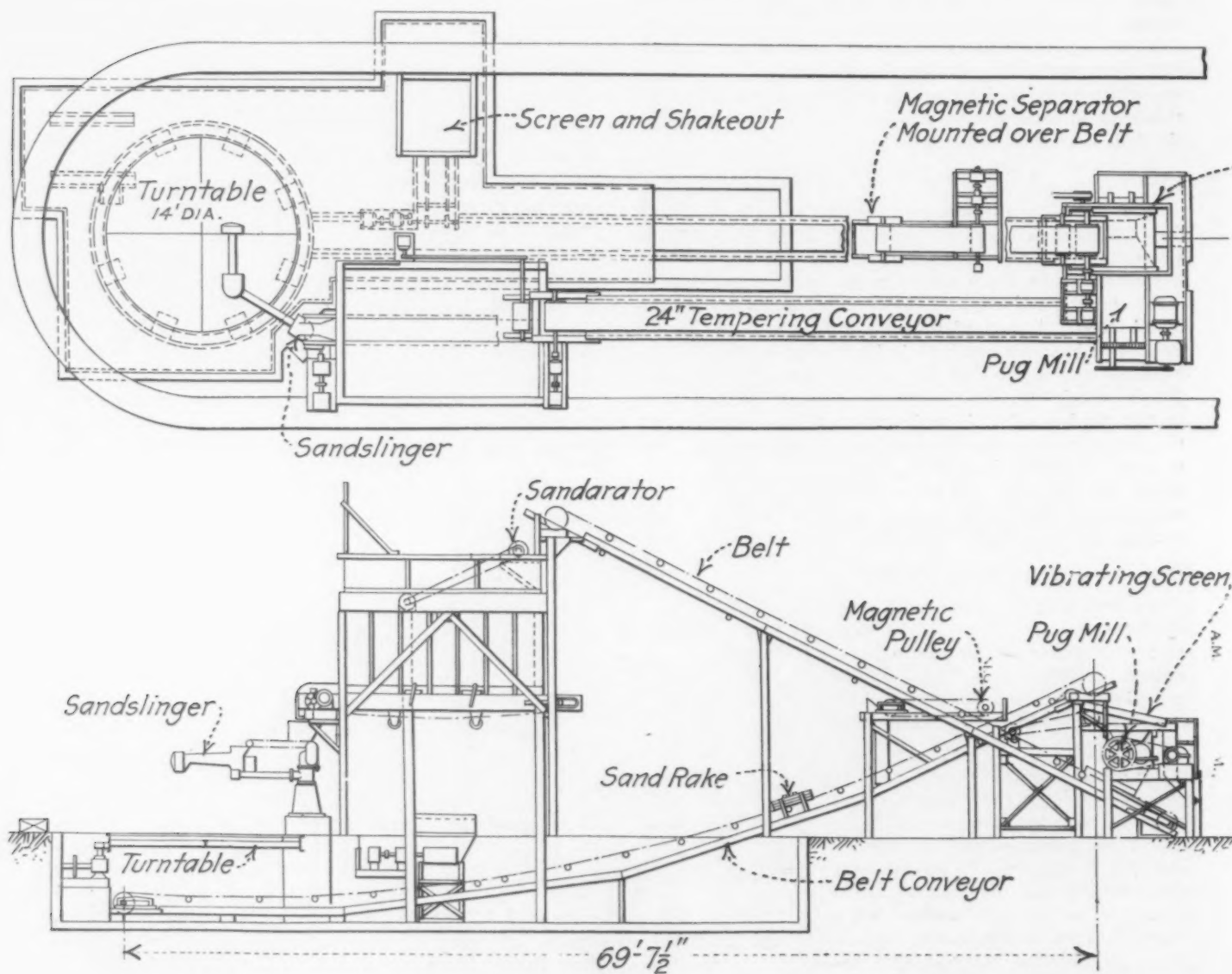
Each Group Has Own  
Sand-Handling and  
Sand-Tempering Outfit  
—Sharp Reduction in  
Labor Cost

**P**RODUCTION at the Kenosha foundry of the Nash Motors Co. has been tripled by the installation of modern molding machinery, a complete system of conveyors, an improved method of charging the cupolas and the group system of casting production. Labor saving is noteworthy. The original foundry structure stood 20 ft. from the sidewalk line. This waste area, 20 ft. x 700 ft., has been covered by a leanto, which is the only addition made to the building. In this space has been concentrated the cleaning department, which is equipped with a conveyor along the outside wall, for delivery of finished castings to the shipping department.

Storage bins for sand, coke, pig iron, limestone and

scrap have been roofed over, to improve working conditions in bad weather. These bins stand along the north wall of the foundry structure and are served by a 5-ton overhead electric crane. Opposite the four cupolas have been erected overhead bins for coke. On one side of these bins is a steep ramp on which the crane unloads pig iron. This ramp and the coke bins feed by gravity to two electrically operated truck cars which travel on parallel tracks that extend from this loading station into the building to a point under the charging platform. The table of each truck will accommodate two drop-bottom charge buckets.

After a charge bucket has been loaded, the truck spots it under the charging crane. A charge bucket which has



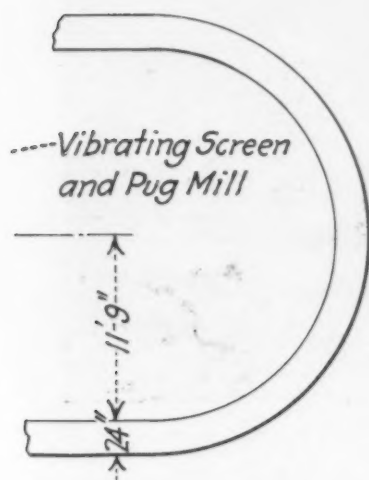


been unloaded in a cupola is lowered by the crane and deposited on the truck. The loaded bucket is raised by the crane, spotted over the center of a cupola and dumped. As soon as the loaded bucket is removed from the truck the empty bucket is transported to the bins, where it is again loaded.

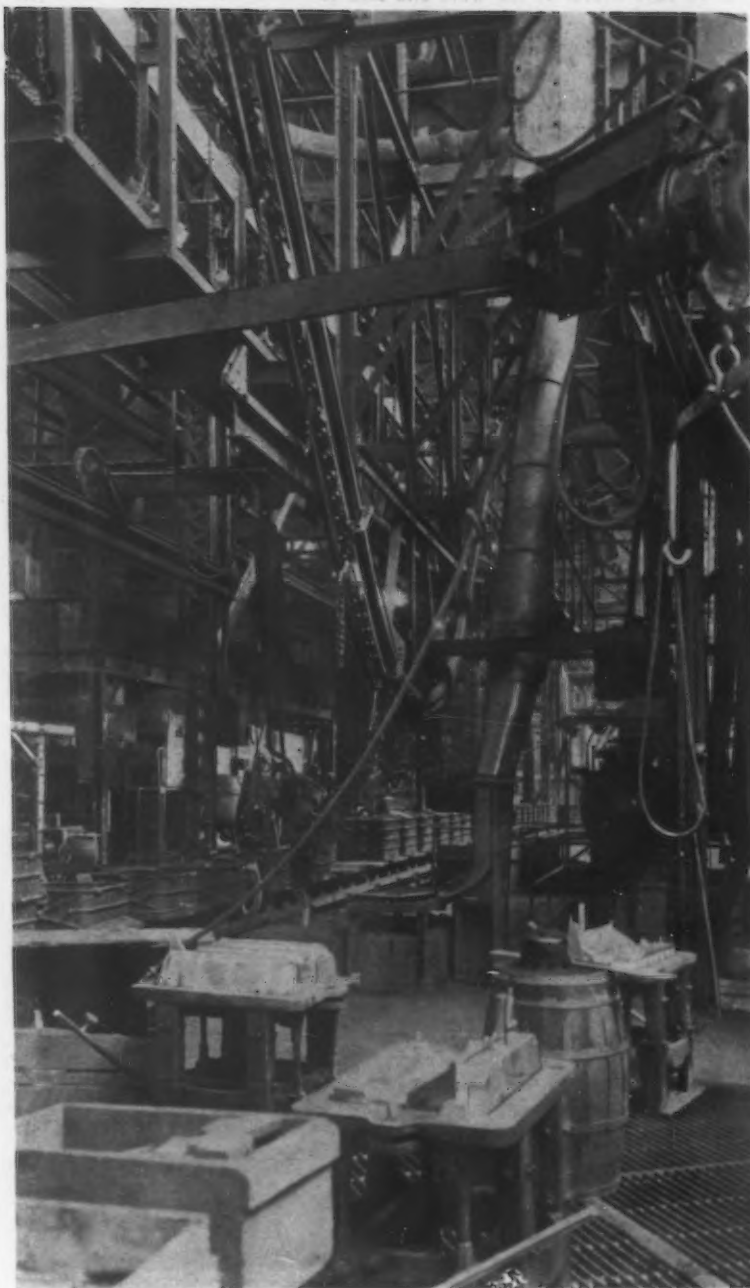
Before this system was installed 16 men were required to handle the charging operations for a 150-ton melt. The plant is still new and has not yet been worked at capacity, but it has been demonstrated that six men can now handle the charges necessary for a 250-ton melt. This charging equipment was manufactured by the Pawling & Harnischfeger Corporation, Milwaukee.

It is worthy of note that the cupolas were raised so that 6000-lb. mixing ladles could be permanently set opposite each cupola spout. Distribution of the hot metal is by means of smaller ladles, suspended from an overhead monorail system which reaches all major pouring stations.

The saving of floor space in this foundry by the use of vertical and overhead core ovens was described in *THE IRON AGE* of May 31, 1928. The present capacity of the foundry made it necessary that another



**O**VERHEAD Conveyors Pick Up Castings at Shakeout Stations for Delivery to the Cleaning Department (Above). The drawing shows how one of the units was laid out and how sand is handled and delivered. The mold conveyor makes a closed loop



vertical core oven be installed, and also an overhead core black drying oven, both of which were designed by Young Brothers Co., Detroit.

#### *Small Molding System Placed Inside of a Large One*

**T**HERE previously had been installed at this foundry two sand-slingers and a mold-conveyor system for six-cylinder engine blocks. Later a flywheel molding system was installed. When the group production plan was adopted it was decided to move the flywheel unit from its old location and to spot it inside of the ellipse formed by the cylinder block conveyor. This move made use of otherwise waste space and cleared a part of the foundry floor for another molding operation in the group plan.

At one end of the old engine block conveyor has been installed a second conveyor loop. Cylinder blocks, after having been shaken out, are conveyed to a mezzanine floor, where the cores are removed. They are then conveyed to the new conveyor loop, where they are progressively ground, sand blasted, shipped, cleaned, re-sandblasted and put under hydrostatic test. The blocks now made on these units are for the 8-cylinder engines which go into cars built at the Kenosha works. After the hydrostatic test the blocks are put on a conveyor which delivers them to the machine shop.

A general picture of the foundry up to this point discloses core ovens at the west end and part way east along the north wall. The four cupolas and the 8-cylinder motor block and flywheel operations occupy the rest of the floor space along the north wall. The remaining floor area consists of all of the center portion of the building, most of the south bay and all of the newly constructed leanto.

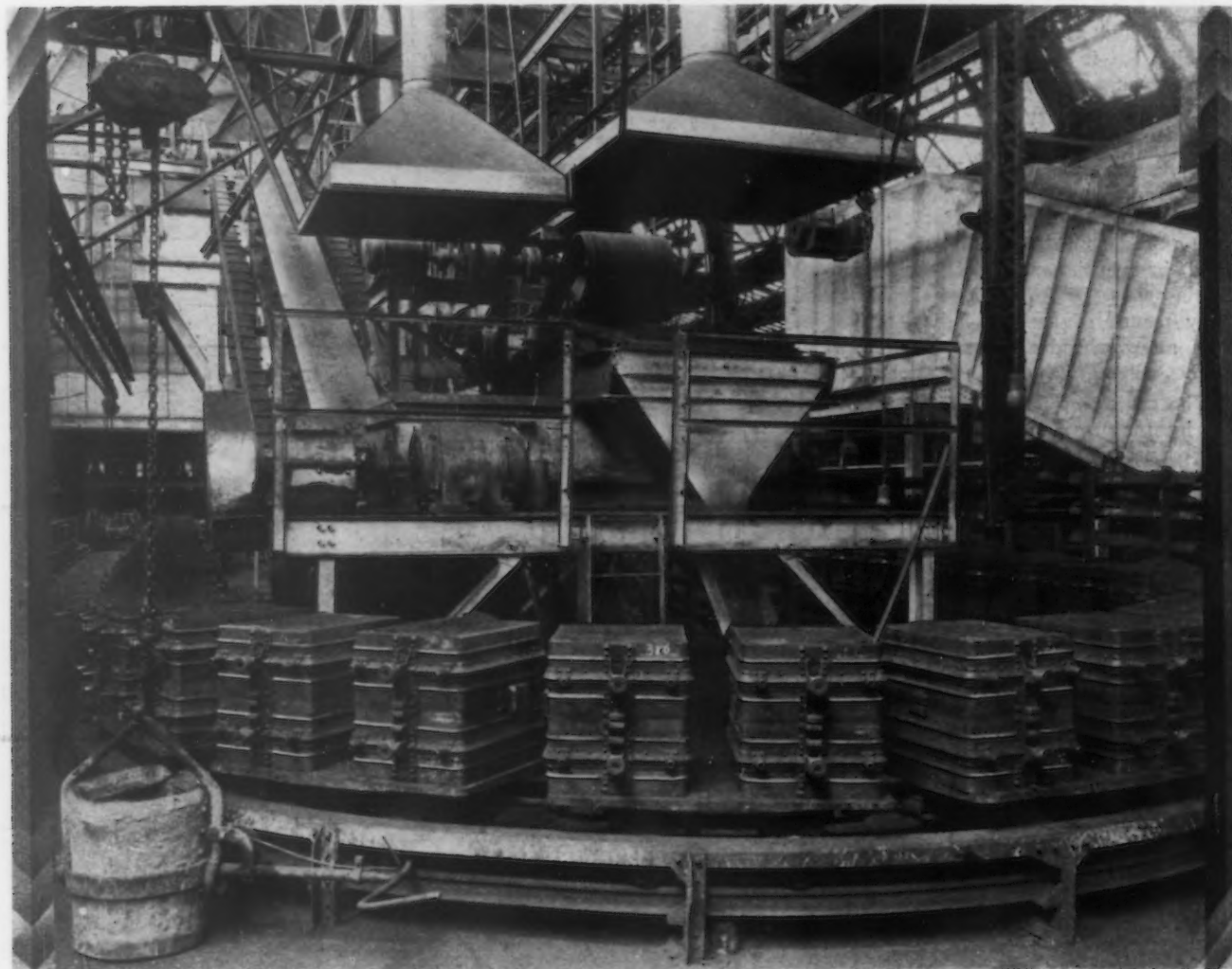
As previously pointed out, the leanto has been given over to cleaning and testing operations. It was most con-

units is being used for the production of small castings.

Adoption of the group plan does not mean that production is not flexible. For instance, the unit which is ordinarily on transmission castings may be used for the production of intake manifolds and exhaust pipes.

#### Some Cleaning Operations Performed on Mezzanine Floors

Most types of castings made on the floor area which has been described pass directly to the cleaning department.



#### TRANSMISSION Cases Are Made at Molding Unit (Above). Tempered sand is handled by means of belt conveyors

Sandslinger Molding Systems Are Installed in Pairs, with Pouring Stations Adjacent to Each Other (Top, next page)

Castings Are Delivered to the Cleaning Room by Overhead Conveyors (Bottom, next page). The platform conveyor along the wall at the left transports cleaned castings to the shipping department

venient, therefore, to make use of the foundry floor space in such a way that certain locations would be given over for definite molding operations and, therefore, by the installation of an overhead conveyor system, castings would be transported only a short distance to the cleaning department.

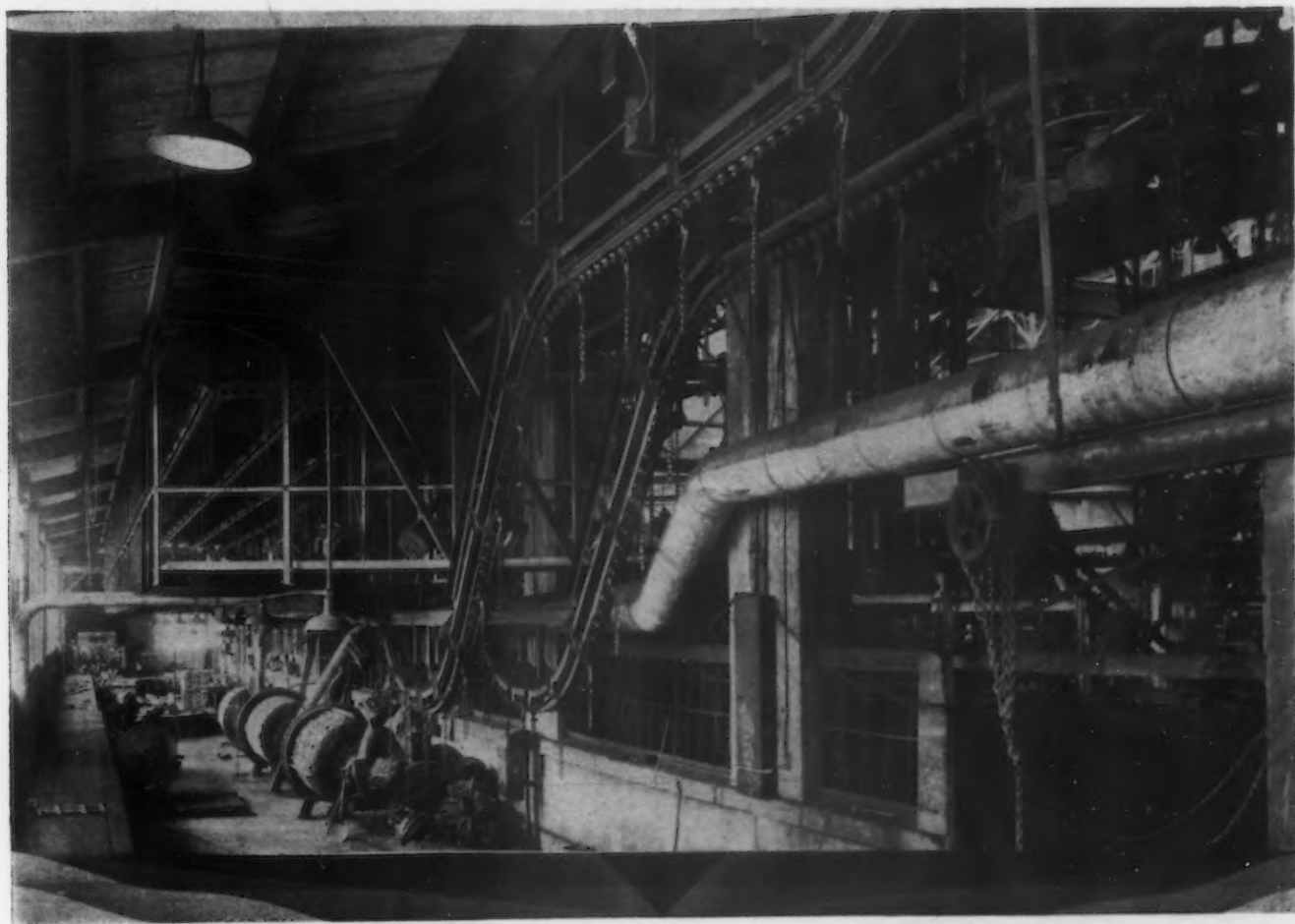
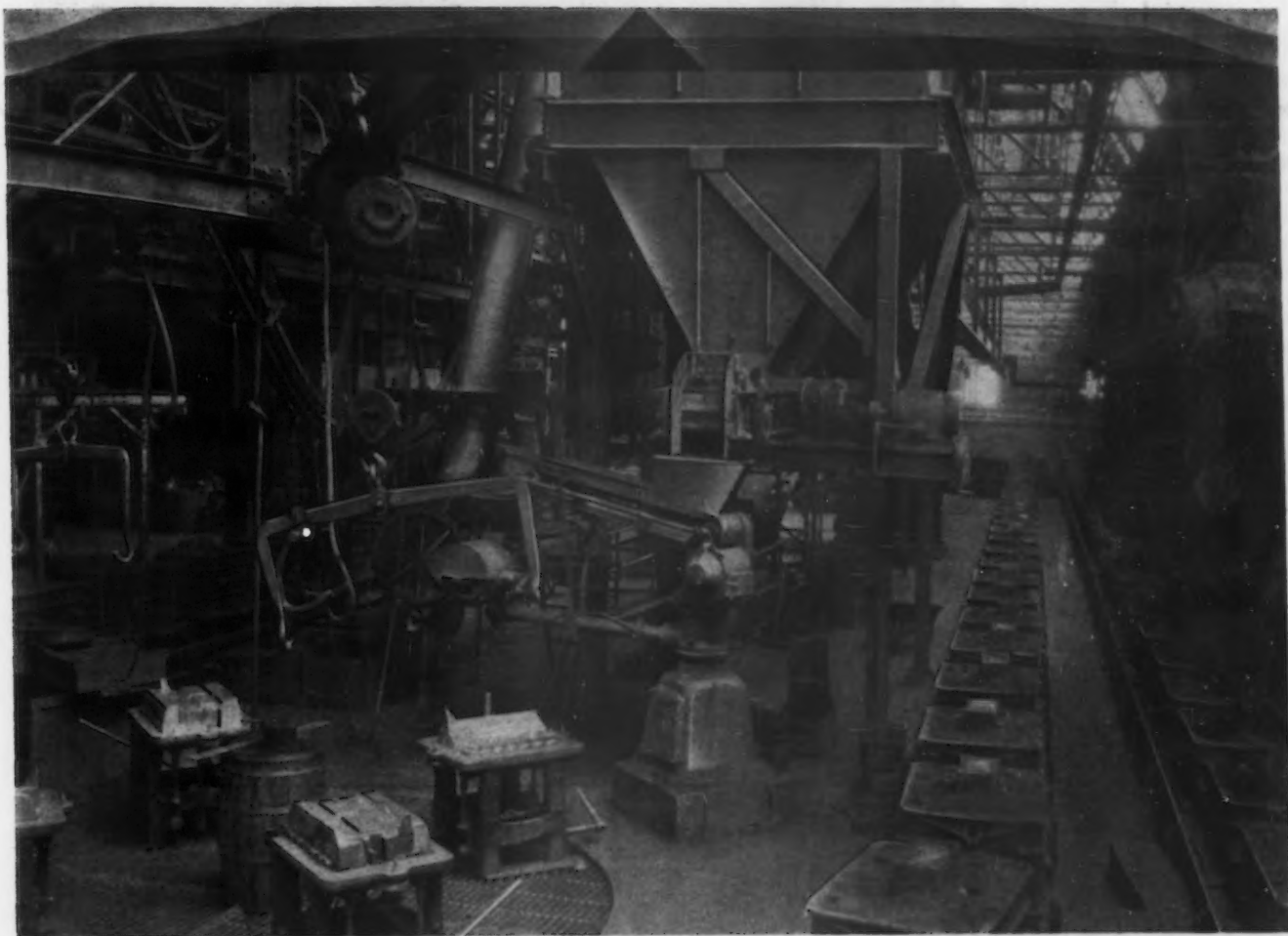
Accordingly, four Beardsley & Piper Co., Chicago, sandslinger units with loop conveyors were installed—two near the west end of the building and two near the east end. These units were placed in pairs, back to back, so to speak, so that pouring stations on the adjacent conveyors could be reached by a single overhead monorail system. Six-cylinder motor blocks are made on one unit; cylinder heads on another; transmission cases on the third and either transmission castings or exhaust pipes on the fourth. Open floor space between the two pairs of these

Cylinder heads, however, are conveyed to a mezzanine floor, where they are cleaned and then chuted to the finished casting conveyor, which delivers them to the shipping room.

The four molding units are of interest because each is self-con-

tained and, further, sand is handled by belt conveyors, rather than by elevators. Each unit consists of a platform loop conveyor, as shown in the diagram, furnished by the Palmer Bee Co., Detroit, inside of which, at one end, is a sandslinger. The shakeout station is on the opposite side of the loop from the pouring station. Copes and drags are handled by a hoist to a stationary grid, from which the casting is picked up by an overhead conveyor which delivers it to the cleaning department.

Sand falls through the grip to a hopper. An apron conveyor takes sand from this hopper and delivers it to a





belt conveyor, which also carries spillage from the revolving grill turntable (14 ft. in diameter) at the sand-slinger. This spillage is fed to the belt conveyor by a strike which pushes the sand through a slot in a pan located beneath the turntable. This belt conveyor then follows an incline passing under a separately installed magnetic pulley mechanism, which removes iron and chutes it to one side.

The belt then carries the sand to a still higher point, where it unloads on a vibrating screen. The sand then drops to a pug mill, from which it is discharged to a second inclined belt conveyor for delivery above a rotating drum aerator. The sand then drops into an overhead storage bin, from which it is delivered to the sandslinger by an apron feeder. The bin has a capacity of 40 tons and the unit has a capacity of 60 tons of sand an hour.

Summation of the molding stations for large castings discloses that there are seven sandslingers in use. At one unit 31 men make 500 six and eight-cylinder block castings in 9 hr., using 28-in. x 48-in. x 13-in. copes and drags and 30-in. x 56-in. x 15-in. copes and drags. At this unit, as at others to be mentioned, the number of men designated includes supervision, core assemblers, core setters, molders, clammers, pourers, runner box makers and shakeout men. At another unit 11 men produce 900 flywheel molds daily. Twenty men working at another unit produce 450 standard six-cylinder blocks. Fourteen men produce 600 transmission cases in a day and seven men make approxi-



**SHAKEOUT** Sand Is Passed Through a Vibrating Screen (Above) to a Pug Mill

All Cleaned Castings Come by Conveyor to a Central Point( Below) in the Shipping Room

mately 500 manifolds each working day.

As has been previously mentioned, the overhead conveyors, made by Palmer Bee Co., reach all shakeout stations. They deliver castings a short distance across the building to the long and narrow cleaning department, which is laid out in sections to handle the type of casting delivered by a conveyor to a given point. Grinders, tumblers and sandblast equipment are mounted where needed near the north wall of the cleaning department. Extending along the south wall is a Chain-Belt Co., Milwaukee, conveyor, which delivers finished castings to the west end of the structure. Those castings which must undergo hydrostatic pressure are tested and, if passed, are replaced on the conveyor

for immediate delivery to the shipping room at the far end.

#### *Castings Are Distributed by Motor Trucks*

**B**Y means of an overhead crane serving the shipping room, castings are loaded on trucks for distribution to various departments at the Kenosha plant, or for delivery to the Racine plant, or the one at Milwaukee. Trucks going to Milwaukee are designed so that, for the return trip, they can be loaded with bodies from the Seaman plant for delivery at Racine and Kenosha.

Underneath the floor of the cleaning department is a belt conveyor which passes under the floor grids and then passes under a magnetic pulley. This conveyor meets a like unit which serves the 8-cylinder block line. Waste sand so gathered is delivered to a hopper of three-car



capacity which stands in the yard. Sand blast equipment used in this foundry was furnished by the Pangborn Corporation, Hagerstown, Md.

An interesting sidelight on the outcome of the use of conveyors is that two electric trucks now operate on the day turn in the foundry and in the cleaning department; formerly eight were used. Electric trucks are no longer needed on the night shift, whereas previous to the installation of the new equipment four trucks were kept in operation at night.

At present the foundry cleaning room and core department occupy 20,900 sq. ft. of floor space. The daily average melt in 10 hr. is 290 tons. The casting loss, including

machine shop scrap, has been cut and the core loss has been reduced. One hundred and fifty tons of core sand is used daily.

Piecework has been discarded and a group piecework plan introduced. Each group of men has a leader. A schedule is set for each group and when they complete their schedule they may leave for home. Each leader is constantly alert to carelessness and laziness on the part of the men under him, and he is quick to make changes when necessary, because he is paid only for castings which are accepted in the shipping room. The new rates have been set so that the men earn more than they did under the straight piecework system.

## British Ideas About Welded Pressure Vessels

IT is probable that the (British) Institution of Mechanical Engineers will appoint a committee to formulate rules for the design and inspection of unfired pressure vessels, and for the certification of completed units. Extended discussion of this matter is reported in contemporary journals abroad, centering on a comprehensive paper by L. W. Schuster on "Strength and Design of Fusion Welds for Unfired Pressure Vessels."

Approaching the matter from the standpoint of an inspecting engineer for an insurance company, Mr. Schuster analyzed the causes of many recorded failures in such construction, and assembled the conclusions of many tests in a suggested code which, if followed, would have avoided all of the casualties known to him. The result is a procedure which is quite conservative, and is limited to vessels up to 36 in. diameter.

He recommends the use of low-carbon plate of flange steel quality, in which the maximum strength of the weld should never be considered to exceed 54,000 lb. per sq. in. In view of the Board of Trade rule fixing a maximum efficiency of 50 per cent for a hammered weld, the same is recommended for fusion welds which are not hammered.

Applying, then, a factor of safety of four gives a maximum permissible stress in the joint of 6750 lb. per sq. in., (somewhat higher than permitted by the present code of the American Society of Mechanical Engineers).

Experiments with many varieties of lap and reinforced joints show that none of them is an improvement on a plain butt joint, welded from both sides, except the plan used in Switzerland of welding short transverse straps at intervals both inside and outside. For this Mr. Schuster would permit up to 12,000 lb. per sq. in. design stress, depending upon other details of construction, principally the use of a circular or oval cover strap, welded all around, at the weak junction of a longitudinal with a circular seam, and the use of specially dished heads which avoid large secondary stresses at the end of the shell.

Special emphasis in all the discussion has been laid upon determining the welder's skill by testing sample joints made under works conditions at monthly intervals. Testing completed vessels is to be done at about twice the working pressure (the exact figure depending on the design and use), the joints being vigorously hammered at the time.

## Mechanized Details Augmented Foundry Output

A STRIKING example of increased efficiency accompanying increased production in the foundry was mentioned by Arthur J. Tuscany, manager, Gray Iron Institute, Inc., Cleveland, in an address, "Important Developments in the Gray Iron Industry," presented at the thirty-second annual meeting of the American Ceramic Society and the American Refractories Institute at Toronto, Canada, last month.

In making automobile engines the crankcase core is usually rammed up in two halves which are subsequently pasted together, said Mr. Tuscany. These cores must be very accurate and it has been customary to rub down the joint of the core by hand to insure a satisfactory casting. Production, under these conditions, was approximately 10 half cores per man per hour.

At the Wilson Foundry & Machine Co., Pontiac, Mich., a machine was built to finish the joint between the two halves of this core by grinding. Two men with this equipment actually turned out regularly 125 half cores per man per hour, compared with 10 by the preceding method. The hand-jointed cores varied from piece to piece by as much as 3/32 in., while the machine-made cores never varied more than 1/64 in. By hand the quality of the product depended on the workman, whereas under the mechanical

method it depended solely on the set-up of the machine, which had to be checked only at intervals of three or four days.

In another case, on the testing bench where the cylinder blocks for Buick cars were subjected to water pressure before delivery to the machine shop, men working by hand each tested 14 sets of cylinders per hour. The holes were closed with clamping pads and expanding plugs. After becoming worn the plugs would occasionally blow out, drenching the operator, who, when not under the eyes of the foreman, became inclined to reduce the water pressure. This resulted in some leaky cylinder blocks finding their way into the machine shop, with generally deleterious effects on the quality of the output of the foundry department.

Later a semi-automatic test rig was provided which stopped all the holes securely and made it impossible for the operator to reduce the water pressure. This device was operated by one man who was thus enabled to handle 75 cylinder sets per hour. Three men were released for other work, but, what was more important, the substitution of an accurate machine for human frailty not only speeded up production but materially improved the general quality of the castings turned out.



# Value of Employees' Suggestions

PRIOR to the advent of scientific management, industrial engineering, and personnel administration, employers and employees—management and men—were regarded as two separate and distinct classes, each having nothing in common with the other. The employers or management were concerned only with making as much money as possible in their own way, by fair means or otherwise. The employees or workers were concerned only with exerting as little physical effort as possible to earn a necessary livelihood.

To the average worker a report of expenditures or cash balance represents a conglomerated mass of account numbers and figures, just the same as a micrometer or caliper appears to the average accountant to be a pretty little instrument serving no useful purpose. Nor is it necessary that the employees sit at the council table of management and take part in the deliberations of the board of directors, to participate in the conduct of the business. The average worker would be as much out of place there as the average director would be at the bench of the mechanic.

## Valuable Ideas Latent in the Organization

Any employer who has the desire to take his employees into his confidence on the question of business operation may do so without disclosing any matter of a confidential nature. This may be accomplished through the medium of suggestion, and the benefits to be derived therefrom cannot be estimated. The fact cannot be lost sight of that all workers are not mere automatons. Some possess undreamed of ability and some have a reservoir of knowledge yet untapped.

It is the ideas of these that the employer should harness and put to work for the benefit of his business or industry. Some managers do not like to seek advice and others object to having it proffered. It should be remembered that all executives are theoretical, but all are not practical. Very often an executive conceives an idea thoroughly theoretical from every angle, but when that idea is put into practice it appears hopelessly impractical and is abandoned.

All employees are practical, but all are not theoretical. Very often an employee conceives an idea thoroughly practical, but when that idea is tried out it fails for the

## Tact and Absolute Fairness Essential in Promoting the System—Rewards Should Be Adequate and "No Favors Allowed"

By A. H. RODRICK\*



reason that the theory of its relationship to some other function was not taken into consideration.

## Combining Practice and Theory

The ideas of those practical employees who have a knowledge of the theory of management are the ideas which will benefit the employer. They may range from moving the location of a single

machine, as a means of increased production, to safeguarding and conserving the issue and use of expensive material.

It is the combination of the unusual—the practical-theoretical man—that the employer should be eager to take into his confidence on the question of business operation. Such men are present in every organization, large and small, though not always known. The machine operator by day may be a deep student of industrial management at night. Potential managers and executives can be found in shops, offices and departments of business if an opportunity is afforded them to develop their latent ability.

When production is lagging the employees can often furnish the cause which the foreman is unable to explain. When the finished product is being rejected in large numbers, the employees often know the reason when the inspector is mystified. When there is lack of cooperation and coordination in management, the employees often hold the key to a situation which the manager does not understand. They are frequently the key-men in industrial and business situations within the organization.

## Men Must Be Approached Tactfully

To get the very best ideas out of employees—those which are really worth while and have a value—the employer must make them feel that he is really desirous of having their suggestions; that his enthusiasm in this respect is genuine and not passive. A contrary attitude is a contributing factor to the common lack of interest on the part of employees in suggestion schemes and the cause of failure of many suggestion systems.

If the employees get the impression that the ostensible motive of the management is a subterfuge to find out all they can about the inside workings, few suggestions will be offered and those submitted will most likely savor of criticism rather than constructiveness. The critical suggestion does not want to be discouraged, for, when

\*Industrial engineer, Washington.





submitted in good faith, it very often has some value.

As a proof of the employer's desire to make use of beneficial suggestions a suitable reward or recognition should be offered, about which more will be said later. The entire matter of suggestions should be brought to the attention of all employees in a businesslike way, and thus the employees will have no cause to believe that the employer's intentions are other than of the best.

Foremen should at all times encourage the workmen under them to offer suggestions, and supervisors should be prevented from interfering with any employee submitting any kind of suggestion. If such action is discovered the guilty party should be severely disciplined.

Often the only employer the workman knows is his immediate supervisor; he caters to him, and is afraid to do anything which might bring displeasure from his "boss." For this reason foremen and supervisors should not be allowed to take advantage of, or to coerce, their subordinates. In such cases the success of any kind of suggestion scheme becomes the responsibility of the supervisors and they should be so instructed. There are still some who dislike giving credit to those under them. It is not a question of credit, but one of better and more economical management.

#### Plea for Cooperation of Employees

To accomplish the desired results there should be installed a suggestion system and suggestion board. A notice should be prepared and posted informing the employees of the employer's desire to inaugurate a suggestion system, and urging all employees to cooperate in making the project a success. The notice should be carefully worded, so that the employees will have no reason to doubt that suggestions of any kind for improvement of the business are both welcomed and desired. The notice should also make reference to whatever rewards the management intends to make for any suggestion considered worthy of adoption.

#### Anonymous Suggestions Welcomed

Particular places should be designated and listed where employees can place their written suggestions in boxes or other depositories. As a rule most employees do not like to hand their suggestions to a foreman or supervisor, and do not care to have their names disclosed unless the suggestion has been accepted. For this reason there should be a place or places designated, according to the size of the factory or business, where they can deposit them in sealed envelopes. Those desiring should be allowed to make use of the mails.

In this way the employees will feel perfectly free to offer their suggestions without fear of prejudice or accusation from any immediate supervisor. Every means should be taken to assure them of the privacy of their

ideas, and to make them feel confident that they will not be made public.

To make this assurance effective the notice should make plain the fact that, should any employee offering a suggestion so desire, his name will not be disclosed. In such cases the employee should be instructed to write the suggestion and not sign his name. His name, check or clock number, and shop, department or office to which he is assigned should be written

on a separate paper attached to the one bearing the suggestion. All envelopes should be collected at stated periods and delivered to the recorder of the suggestion board who opens them.

All suggestions received should be courteously acknowledged. When the employee's name is not to be disclosed the suggestion should be given a number and a record of it made, together with the name, etc., of the employee. In acknowledging the receipt of such a suggestion the employee should be informed of the number assigned to it. The recorder of the board is

the only person who should have knowledge of such information and it should not be disclosed to anyone until the suggestion has been accepted, and then only in an official way. To betray the confidence of the employee in any such case is to render the whole suggestion system valueless—the one thing to be most guarded against.

#### How to Handle Suggestions Offered

A suggestion board should be appointed, composed of at least three executives who are qualified to pass upon the value of the suggestions offered. There should also be a recorder of the board, and this position should be filled by the personnel manager or like authority. Once a month the recorder should submit to the board all suggestions received, and each should be carefully considered as to its merits and the advantages to be gained by its adoption.

Upon completion of the board's deliberations a report should be submitted to the head of the firm, giving each suggestion in full, its number, and the board's recommendation regarding it. If the head of the firm approves the recommendations of the board, the recorder should notify by letter the author of each suggestion of the final action taken. Letters of commendation and notices of cash awards should be signed by the head of the firm.

#### Trial or Deferred Acceptance

It is advisable to try out some suggestions before finally accepting them. There will be those offered which are impractical of adoption at the time, yet have a potential value for future use. A suggestion which cannot be used at the time it is offered should not be rejected. It may discourage the employee from submitting others.

When a suggestion is once offered, a contact arises which may result in unlimited benefit in the future. The employee feels that his interest has been rewarded in a measure, and an incentive is created to renewed and better effort. All suggestions having merit, which cannot be adopted at the time they are offered, should be kept on record. At a later date the employer may find among them the very idea he is seeking.

Whatever awards are offered or agreed upon should be

**P**RACTICAL ideas are valuable, wherever originating. Men in daily contact with details of a business often see how things can be improved; managerial duties may not permit similar observation on the part of the "boss." This article tells something of the way in which a suggestion system may be worked out, with mutual advantage to employer and employee. Also, some of the pitfalls are pointed out.



paid without limitation, to prevent distrust. They should also be made on the basis of absolute equality. The worker should receive the same as a supervisor. Such fair practice will serve as a deterrent to supervisors from interfering with employees offering suggestions. The nature and character of awards depend upon the particular industry or business.

Some firms offer a stipulated amount in money to be awarded each month to the employee submitting the best suggestion. Others set aside a fixed amount to be distributed among the employees whose suggestions are accepted. Others promote in pay or advance in position those employees who contribute to the betterment of management, operating processes, or production incentives. The latter plan results in the discovery of latent foremen and executives.

#### Patent Cases Must Be Watched

If a suggestion is accepted which involves a patentable feature, caution must be taken to safeguard against possible future litigation. In this connection two distinct cases arise, namely, that of a workman who develops a valuable invention in his employer's time, using his employer's tools and materials; and that of a workman who develops the invention in his own time and with his own materials at home.

In the first case the employer has the right to use the invention in his shop. He has no right, however, to use the invention anywhere except in his own shop. This right is so limited that, if he moves away or sells that shop, he cannot take the right to use the patent with him.

In the second case the manufacturer has no claim over

the invention at all, since the employee has a right to his ideas, provided he uses his own time and materials to develop them. This holds, even though the invention may be in the line of work of the employer. If the employee is hired for the purpose of inventing, everything he does in the line of the company work belongs to the company. If he invents something that is not in the line of the company's manufacture, it cannot hold the invention.

#### Written Contracts Often Help

To avoid pitfalls the employer should, when adopting a patentable suggestion, enter into a written contract with the employee whereby the employee for a consideration agrees to assign his idea and invention to the employer. In this way the employer will be relieved of any legal responsibility during the tenure of employment of the inventor and avoid a possible lawsuit should the invention be used after the employee has left his service.

In conclusion, the value of suggestion is measured by the desire of the employer to take the employees into his confidence on the question of business operation. This may be accomplished in the easiest and most satisfactory manner by allowing, inviting, and encouraging the employees to submit their ideas in the form of suggestions.

C. E. Knoeppel has said: "I know of no greater responsibility of man, than that of the one—whether worker, supervisor, executive, owner, banker or lawyer—who, in industry, either by accident which is inexcusable, or by design which is unpardonable, fails to do all in his power to help workers give birth to their mental children." Allow and encourage your employees to think and you prevent an industrial and business waste.

## Manufacture and Properties of Light Welded Tubing

**T**HIN walled steel tubing, made by electrical resistance welding by Steel & Tubes (Inc.) of Cleveland, has been investigated at the Bureau of Standards and the findings published by Messrs. Whittemore, Adelson and Seaquist in Research Paper 161.

#### Method of Manufacture

Such tubing is made of mild basic steel; chemical analysis is approximately as follows:

Carbon .....	0.08	per cent
Manganese .....	0.40	per cent
Phosphorus .....	0.015	per cent
Sulphur .....	0.035	per cent
Silicon .....	less than 0.01	per cent

Box-annealed cold-rolled strip is passed through a series of rolls to give it tubular form, with edges accurately butted. This blank is then passed at the rate of about 50 ft. per min. between two electrodes which make continuous contact on both sides of the seam. Passage of current brings the edges to a welding temperature and they are squeezed together while at this heat by proper mechanical fixtures.

As welded the seam has a small irregular burr on both inside and outside. The outer surface may be smoothed by a planer tool as it leaves the welding machine. Diameters are from 0.02 to 0.04 in. greater than nominal.

For dimensions of higher precision and smooth inside and outside surfaces, the welded tubing is passed through a swaging machine. This has slightly tapered dies of proper curvature for the outside diameter, and the tube is hammered on a stationary mandrel of correct inner diameter. Swaging without the inside mandrel, as well as cold rolling in circular-grooved rolls also produces tube with smooth outer surface, but which retains the slight bulge along the inside of the welded seam. Tubing is also

available cold rolled over a mandrel, and in the annealed condition.

Tubing tested at the Bureau of Standards had nominal dimensions ranging from 5/8 in. diameter by 0.03 in. wall to 3 in. diameter by 0.08 in. wall. The swaged tubes were quite accurate in dimension; 88 per cent varied less than 0.003 in. in outside diameter. An even higher degree of uniformity in wall thickness was observed—a resultant from the accuracy with which the strip was rolled.

Swaged and rolled tubes have about the same tensile properties when tested in full section (figures are given below), and are approximately 10 per cent stronger than the tubes as welded:

Ultimate strength.....	57,500 lb. per sq. in.
Yield point .....	53,000 lb. per sq. in.
Proportional limit.....	37,000 lb. per sq. in.
Elongation in 8 in.....	13.5 per cent
Elongation in 2 in.....	32 per cent
Modulus of elasticity....	28,500,000 lb. per sq. in.

Under hydrostatic tests the bursting strength of short pieces was higher than the tensile strength of circumferential strips cut from the tube (probably due to end support). Only one specimen fractured in the weld, and this was an annealed tube, one of a group of which the others burst outside the weld and at lower pressures. Fractures otherwise bore no definite relationship to the welds. Average bursting pressures are as follows:

As welded with outside burr cut..	60,060 lb. per sq. in.
Swaged .....	62,550 lb. per sq. in.
Rolled .....	59,800 lb. per sq. in.
Hard rolled .....	79,950 lb. per sq. in.
Swaged and annealed.....	47,840 lb. per sq. in.

The research paper from which these data have been taken contains detailed information on axial crushing tests, torsion tests, strength and microstructure of the weld, hardness of the tubes, and ability to flange.





# Bridge Wire Requires Fine Steel

Outline of Fabrication Processes Indicates Necessity of  
Close Coordination of All Departments Intent  
on Producing Nothing But the Best

BY FREDERICK A. WESTPHAL\*

ONE of the most masterful achievements for a steel company in this era is the complete manufacture of bridge wire such as furnished to the Philadelphia-Camden, Hudson River, Detroit-Windsor and similar suspension bridges. To start at the open-hearth furnace charge (of course not overlooking the great importance of the blast furnace operations) and follow through to satisfactorily finished wire ready for shipment, calls for a well-experienced, courageous and fully cooperative organization. Making bridge wire involves so many different steps and processes, that equipment and organization must be united into a strong chain to succeed in the task and make a profit.

This article will dwell mainly with the processing from the billet through to finished wire, but to make it complete, suggestions are given from the start of manufacture, that is, from the charge into the open-hearth furnace. Furthermore, the object sought is helpfulness for the future and not for controversy.

The problem is as follows: To make 0.192-in. galvanized wire with the following principal properties: A

\*Superintendent wire department, Sheffield Steel Corporation, Kansas City, Mo. Sometime assistant superintendent wire department, Jones & Laughlin Steel Corporation, Pittsburgh, and rope engineer, American Steel & Wire Co., Worcester, Mass. The head piece is a construction photograph of the lower deck roadway, Manhattan Bridge. All views secured through the kindness of Robinson & Steinman, consulting bridge engineers, New York.

minimum tensile strength of 225,000 lb. per sq. in., galvanized to withstand five immersions in the Preece test, with elongation of not less than 2 per cent in 12 in., and to stand a wrap around 1½ diameters without sign of fracture in the steel. Other specifications are imposed too numerous to mention here.

## Quality of the Steel

FOR attaining the above results from the wire the open-hearth may work to the following ladle analysis:

Carbon .....	0.75 to 0.85	per cent
Manganese .....	0.50 to 0.70	per cent
Silicon .....	0.10 to 0.20	per cent
Phosphorus .....	0.04	(maximum)
Sulphur .....	0.04	(maximum)
Copper .....	0.02	(maximum)

The six productive methods of making steel in this country today are: (1) crucible, (2) acid open-hearth, (3) basic open-hearth, (4) acid Bessemer, (5) duplex (Bessemer to open-hearth), and (6) electric furnace, acid or basic lined.

The best steel could be obtained from the crucible and electric methods. Crucible steel is, of course, impractical on account of the very small sized heats and prohibitive cost of manufacture; electric steel is in the same category at this time, but very likely electric steel furnaces in the future may be developed of large enough size to be han-



dled practically and profitably for bridge wire. Bessemer steel to the required analysis is obviously undesirable, and although some duplex steel may work satisfactorily it should not be used because of inconsistencies of segregation, oxides and non-uniformity of structure.

This leaves two methods for making the steel, namely acid and basic open-hearth. Heretofore acid steel has usually been specified for bridge wire. It is known that it is a cleaner steel, and works nicer in the various stages of the process. Furthermore, a comparison of acid and basic steel of practically the same analysis shows that in the long run acid steel is a little more consistent in final physical tests. However, these facts do not mean that basic steel cannot be used. It was formerly believed that certain sizes and grades of wire rope had to be made of acid steel, but wire rope makers are now able to make as good wire rope using basic steel of similar analysis as they were formerly able to produce from acid steel.

Extreme care should be taken in choosing scrap for the open-hearth charge to avoid impurities and alloys, such as automobile scrap would introduce. Scrap for steel of this nature should be obtained on analysis, such as shear scrap, crop ends and high grade melting scrap. A plant operating blast furnaces could go to the extreme of furnishing the hot iron from ores carefully selected for Bessemer iron, thereby having a minimum of sulphur and phosphorus.

In view of the above facts, it is my opinion that basic steel made with the same care as acid steel, and of particularly well selected raw materials, could be used for bridge wire.

#### *Ingot Practice of Prime Importance*

**P**RACTICE varies in steel works as to the size of heats and ingots used, but the heat should not exceed 100 tons, and the teeming should be at such a speed as to prevent inclusion of gases and bubbling. The ingot molds should be the hot top type to counteract piping and segregation as much as possible. A maximum size would be approximately 22 by 24 by 84 in., with a weight of 8800 lb. Care should be taken to allow complete solidification of the steel before stripping. Uniform and a penetrating heating is required in the soaking pits; temperature should not exceed 2200 deg. Fahr. before blooming.

It is important to keep individual heats of steel separate from one another in their passage from the open-hearth to the finished wire. Assuming complete records are being kept of each operation, reference and study can be made of any difficulty met in subsequent operations by keeping heats properly identified and segregated.

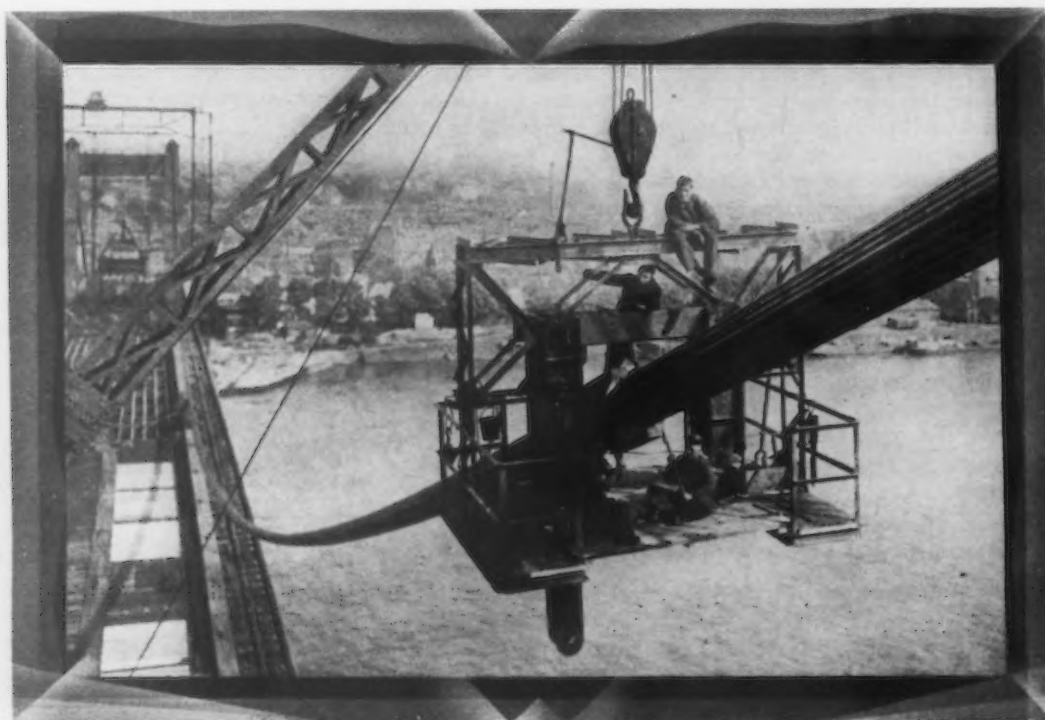
On a two-high reversing blooming mill the head roller is tempted to take too great a reduction per pass, thus injuring the steel with telling effect later. Three-high blooming mills are preferable, because the reductions can be adjusted by the roll setting and are taken more evenly.

The bloom, before going to the billet mill, should be cropped at top at least 10 or even 12 per cent, even though hot tops are used, and at this point careful inspection should be given to insure that all trace of piped metal is discarded. Of course, at least 3 per cent of the bottom or back end of the bloom should be discarded. Some mills have surface scrapers to act on the bloom or at some passes in the billet mill. This is a good feature, but the nature of high carbon steel surfaces is such that this detail should not be necessary if previous precautions and good practices have been closely observed.

#### *Billet and Rod Mills Require Careful Adjustment*

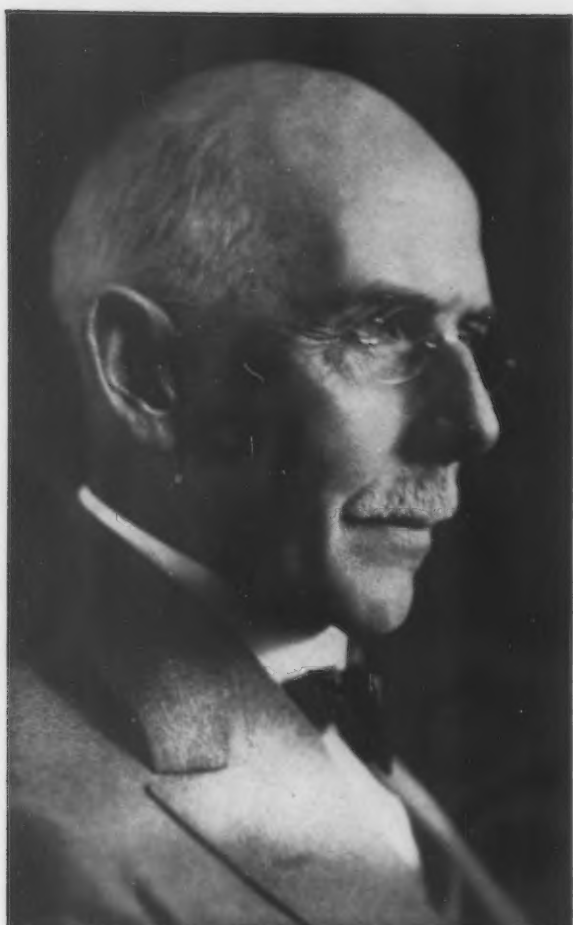
**A**SSUMING that a Morgan rod mill is to roll the rods, the billets should be 2 in. square, 30 ft. in length, weighing approximately 400 lb., in order to give the desired length of finished wire. Since the future holds forth probabilities that bridge wire is to be furnished in longer coils, the majority of the latest rod mills are designed to take a heavier billet than above stipulated. The heavier billet, of course, is easily rolled on present-day billet mills. Before the billets are delivered to the rod mill they should be put over the chipping beds, all four sides closely inspected for seams, laps and slivers. Such defects should be marked and chipped out, or if too deep the billets should be rejected. Both ends should be carefully examined for visible piping or segregation.

From the open-hearth charging floor through to the finished and inspected billet the effort has been made to point out very briefly that a detailed line up of the best steel works practice is required for the basis of bridge



**M**AIN Cables for Long Suspension Bridges Are Usually Spun One Wire at a Time, But Spans Up to 1200 Ft. Have Used Assemblages of Rope-Stranded Cables. This view shows the compacting of 37 such cables into the main support for a bridge across the Rhine at Cologne, Germany. On the opposite page is the recently completed St. Johns bridge across the Willamette River at Portland, Ore. Each of its main cables contains 91 1½-in. twisted strands





Alvin I. Findley



## A Personal Message to

WITH this issue of THE IRON AGE I am passing to other hands the responsibilities of its editorial direction which I have carried for most of the 25 years of my connection with the paper. William W. Macon, my associate for 19 years, managing editor for the past 12 years, has been appointed to succeed me as editor-in-chief. What he and his loyal co-workers have done to make a great industrial paper greater has been known and read in these recent years wherever THE IRON AGE has gone.

This is not the place to enlarge on the ideals and the accomplishments of THE IRON AGE in the past 25 years. Such comment may better be reserved for the 75th anniversary issue which will appear in the next few months. It is enough to say here that I have striven constantly for these four as the chief aims of an industrial journal:

To publish concerning the manufacture, marketing and use of the products of its industry the largest possible amount of essential information that can be found nowhere else.

To increase to the utmost the use of the products of its constituency.

To that end to advocate constant improvement in the quality of all products and new economies in their manufacture; at the same time anticipating changes in the economic trend and in the desire of the consumer.

MR. FINDLEY'S announcement is not an unqualified valedictory. THE IRON AGE and its readers will still have his counsel. He has consented to serve as editor emeritus.

He relinquishes active editorial direction, but we are confident that from time to time his stimulating thoughts will continue to grace the pages that have reflected his personality these many years. There are other paths than journalistic that he now would travel, but his interest in THE IRON AGE and the problems of its readers will run on.

His successors are dedicated to the same principles that he has so cogently and tersely set forth as having dominated his

IT is with profound regret that we accept the resignation of Alvin I. Findley as active editorial head of THE IRON AGE.

His broad knowledge, sound judgment and penetrating analytical faculties have contributed conspicuously to the upbuilding of this publication for the past 25 years. A man of courage and high personal standards, he has kept THE IRON AGE on a high journalistic plane, never compromising principle for the sake of expediency. He saw in his paper a powerful instrument for extending the use of industrial products and thereby enlarging the life and increasing the well-being of all of the people. His idealism has not been in vain—it accounts for the high respect that THE IRON AGE commands throughout the land.

Mr. Findley's policies will be carried on. As editor emeritus and a director of the United Business Publishers, Inc., he will continue to give THE IRON AGE the benefit of his counsel. His successor as editor is his collaborator and understudy for many years, William W. Macon, heretofore managing editor.

An engineer, graduated from Cornell University in 1898, Mr. Macon is in intimate touch with the many technical developments that have wrought miracles in American production.



# age to Our Readers

To hold up continually to its readers as their highest aim the advancement of the public good.

On that platform the editors of THE IRON AGE have applied its full power to the upbuilding of our greatest manufacturing industry, the production and working of the world's basic metals. They have never forgotten their obligation, in view of the common thought of THE IRON AGE as an institution and of the fact that in the public mind it has long been identified with the commanding place of metal working in our industrial life.

Never has the editorial staff of this journal worked to so good effect as in this year in which it rounds out three-quarters of a century as the country's preeminent publication in industry. Never have the editors had such resultful contacts with the men who are making history in the metal trades. And never have our readers so freely commended our editorial pages. I have great satisfaction in knowing that in the years ahead these most valued associates in many strenuous labors will steadily increase the enterprise of THE IRON AGE and bring it to a new peak of prestige.

A. J. Findley

policy for a quarter of a century. If, in the course of years, we are privileged to review achievements comparable in some small measure with the advances of THE IRON AGE in scope and influence under Mr. Findley's stewardship, it will be with full recognition of the strength of the publication when he entrusted it to our hands.

W. W. Macon

His long association with THE IRON AGE has made him equally conversant with commercial and economic problems. A digger for facts by training and a master of detail, he also has a breadth of view and a catholicity of interests commensurate with the magnitude of the industry that THE IRON AGE serves.

At a time when advances in technique and output are conditioned as never before by keen competition within industries and between industries, Mr. Macon is eminently qualified to interpret the interplay of all these forces and their relation to the entire metal-working field and the industrial world as a whole. With equal facility he speaks the vernaculars of the technical man, the production man, the commercial man and the executive.

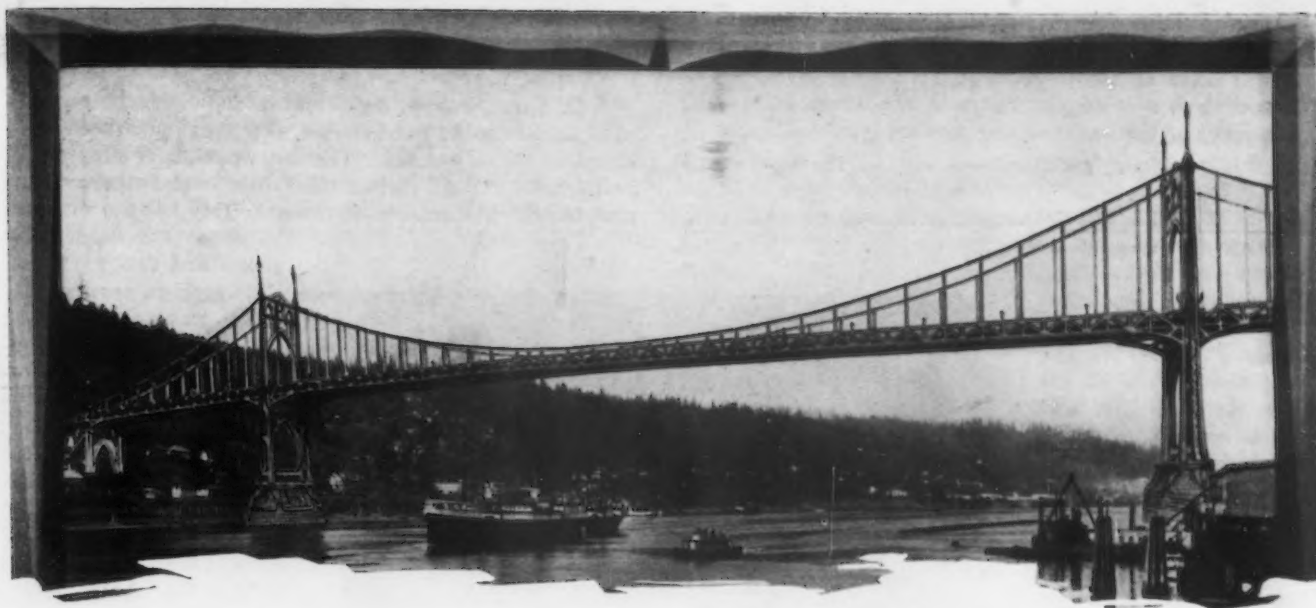
Julius J. Frauer



William W. Macon







wire manufacture. This really produces a fine quality of steel. From this point on it is strictly up to the wire specialist to produce a satisfactory wire.

The practice from the billet is briefly as follows: the 7/16-in. diameter rod is patented, cleaned, sll coated, line coated, baked and drawn six drafts to finished size (0.192 in., with tolerance of 0.002 in. over or under). This bright wire is then galvanized, after which it is ready for shipment. Each of these steps in process are vitally important to satisfactorily finished wire, and faulty operations in any step would give disastrous results, therefore each operation will be discussed in detail.

It has been previously mentioned that each heat should be kept separate; therefore, the billets of bridge wire heats are placed on the rod mill skids, properly marked and separated from those ahead and to follow. Here reinspection should be made for surface imperfections before they are charged into the heating furnace. The recuperative type of furnace is generally used in modern rod mills; here the heat must uniformly increase as the billets work down the furnace, and be so adjusted that when ready to enter the rod mill the ends of the billet as well as the center, has reached a uniform heat, somewhere between 1900 and 2000 deg. Fahr.

### *Patenting Is an Essential Preliminary*

**T**HERE are various designs of rod mills available today, any one amply capable of rolling a first quality wire rod. The guiding points, providing the roller has his mill correctly set up, is to roll "hot," that is, from 1900 to 2000 deg. Fahr., have a minimum of water from the finishing stand of the mill to the reels, and rigidly prohibit water on the reels. Otherwise a spotty martensitic structure will be produced on the coils, a microstructure that would make those parts of the rods quenched by the water very brittle and cause many brittle breaks in subsequent operations. As the rods come out on the conveyor every coil should be closely inspected for surface imperfections and size, and the finned ends trimmed.

After the rods are rolled, heat treatment of this high carbon steel is the next process to be accomplished. Space is too limited to illustrate the layout or design of patenting equipment, but briefly the furnace should be at least 50 ft. in length with a lead pan not less than 18 ft. long built at the exit end for a quenching bath. Separators should be built inside the furnace proper to prevent

any cabling of heated rods, as contact would cause a non-uniform patenting effect. The heat in the furnace proper and in the lead pan should each be controlled by thermocouples placed at suitable points. Although the steel used is near the eutectoid composition, and its critical temperature is approximately 1325 deg. Fahr., it is essential to attain a heat well over the critical, namely, 1625 to 1675 deg. Fahr.

Hot rods should be passed directly into the lead pan without contact to the air. The lead is held to uniform temperature either by blowers, water-cooled pipes, or both. Temperatures in the lead bath should be varied slightly for different heats, as determined by "shoe-string tests" run for each individual heat. It will vary between 850 and 950 deg. Fahr.

Structure of the patented rod will be sorbite. Tensile strength should be 145,000 to 165,000 lb. per sq. in., elongation approximately 10 per cent in 10 in. and reduction of area at least 50 per cent.

Patenting must be very carefully supervised. Strict uniformity of heat according to schedule must be demanded. The speed at which the rod is drawn through should be so regulated as to insure a penetrating heat at the specified temperatures, otherwise the finished physical properties desired of the wire will be lacking. "Slack patenting" is one cause of rejection, due to none other than poor patenting conditions, and shows up in the physical tests as a low percentage of reduction of area, and a failure to stand bend or torsional tests on the finished wire.

Difficulty may be experienced at this stage by hot lead adhering to the finished patented rods. This cannot be cleaned off in subsequent acid cleaning operations unless an excessive amount of acid is used, and even then the lead will be only partially cleaned off. Such extra acid cleaning invites "acid brittleness," but all adhering lead will give trouble in drawing and in the subsequent galvanizing process. One very good device to prevent this condition is a header full of weak coke breeze through which the patented rods pass after leaving the lead pan.

### *Operations Required to Give Proper Surface on Rod*

**T**HE importance of proper conditions in the pickling tank for cleaning off the mill scale from the patented rods cannot be emphasized too much. When 66-deg. Baumé sulphuric acid is used the cleaning solution should have



from 5 to 8 per cent acidity, and under no circumstances should be hotter than 110 deg. Fahr. If the temperature at this point be 165 to 180 deg., such as is used for low carbon steel, it is certain that acid brittleness will result, regardless of the intensive baking done later.

Three or four inhibitors are now on the market, of either vegetable, coal oil or petroleum base; one of them should be used in the cleaning solution, because it not only reduces the amount of acid necessary to clean the rods but very effectively prevents "over-cleaning"—that is, pitting the surface of the rods—as well as acid brittleness. Should acid brittleness appear in final tests on the wire, the first place to look for trouble is in the records of the acid cleaning house, because it is well accepted that steel, especially high carbon steel, absorbs hydrogen from an acid cleaning solution just as a sponge absorbs water. (However, hydrogen in steel does not absorb as quickly as water does in a sponge.)

After the rods have been well cleaned of scale and washed of acid they should be placed under an atomizing spray of water and left for some time. The amount of sull-coat or hydroxide of iron given the rod depends on the temperature of the cleaning house and the humidity of the air, but under normal conditions 25 to 30 min. is sufficient. Moist rust at this stage is a very good lubricant in the wire drawing dies for high carbon steel rods.

Next the lime coat is obtained by submerging the rods repeatedly in heavy lime at about 160 deg. Fahr. By "heavy lime" is meant water with choice slaked lime, thoroughly mixed in a thick suspension.

Bakers should be controlled by a recording thermometer, and the rods should bake for 10 to 12 hr. at 400 to 450 deg. Fahr. This should drive out any normal amount of hydrogen in the steel, dry the lime coat and sull coat and put the rods in suitable shape for the drawing dies.

### Wire Drawing Schedule

EQUIPMENT for drawing bridge wire must be exceptionally large and powerful to accomplish the desired reduction. For better control of each draft and for safety considerations, individual motor drives for the wire-drawing blocks are now most acceptable. Present practice is for one draw at a time; "double decking" may be acceptable in the future. (Double decking uses one motor-driven spindle for two drafts. The first draft is taken on the lower tier or block and then the wire is passed around a

sheave at the die holder, then through the second die on the upper tier or block for the second draft. The ratio of the lower tier or block to the upper is as 17 is to 22.)

To facilitate handling, control and workability, the block should be 30 in. diameter; the maximum speed 16.5 r.p.m., or 130 ft. per min. The dies would be of alloy steel, heat treated. High carbon steel should not be reduced in area too quickly or severely because this has an adverse

effect on the bend, torsional and fatigue tests. This problem resolves itself to an average of 24.5 per cent reduction in area for each draft. That means that, starting with a 7/16-in. diameter rod, each of these successive six drafts have the following diameters: (1) 0.384, (2) 0.334, (3) 0.290, (4) 0.252, (5) 0.219, (6) 0.192 finish. It is understood that practical mill tolerances of 0.002 over or under are allowable for each draft.

To prevent scratching the surface of the wire or cutting out the bearing of each respective die, and to aid in the reduction for each draft, a lubricant of high-grade powdered soap thoroughly mixed with a small portion of dry powdered hydrated lime is used. It depends on the quality of the lime coating (which serves as a lubricant in drawing as well as neutralizing the sulphuric acid left after cleaning the rods) whether the soap and lime lubricant mentioned will be used before each die. Providing the lime coat and sull coat is sufficient, it is likely that the lubricant will be needed on the first three drafts

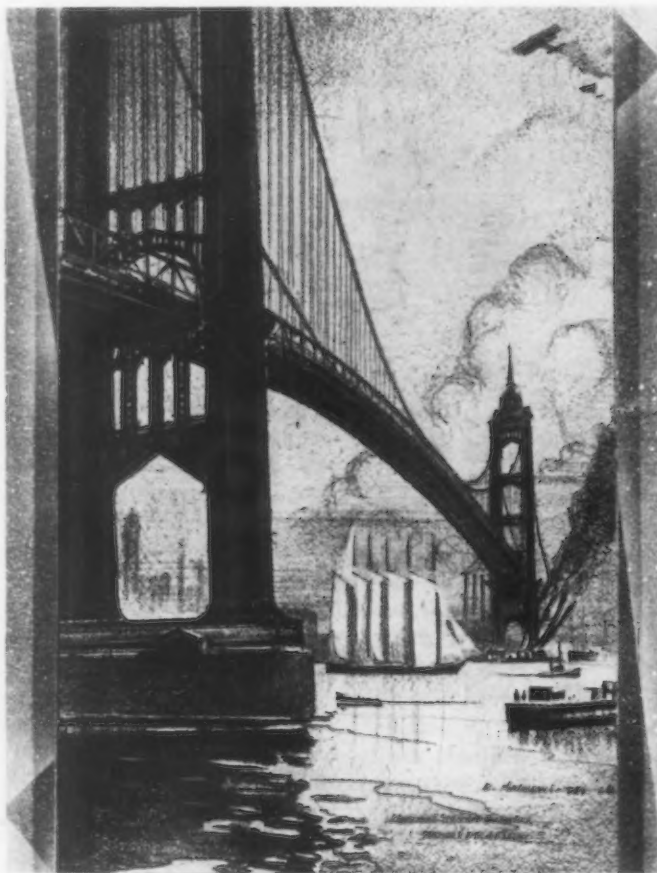
only. Practical judgment and experience will determine this point.

After the wire has been drawn to finished size, that is, 0.192 in. with 0.002 in. tolerance over or under, each coil of wire should be thoroughly inspected and tested on the front and back end to the following minimum requirements:

240,000 lb. per sq. in. tensile strength.  
40 per cent reduction of area after fracture.  
2 per cent elongation in 12 in.

AFTER the wire has been inspected and has satisfactorily met the beforementioned specifications for bright wire, it is ready for the next process in manufacture, namely, galvanizing. This process is continuous; that is to say, the individual coils of bright wire are placed on individual reels, run through the galvanizing unit, and wound on the take-up blocks as finished wire ready for final inspection by the purchaser's representative.

There are three clearly defined steps in this continuous operation, each dependent on the other. Due to the



ALTHOUGH a Bridge with 3500-Ft. Span Is Now Being Built Across the Hudson River at New York, the Limit of Length Has Not Yet Been Reached. This view shows D. B. Steinman's proposed "Liberty Bridge," to carry traffic from Long Island to Staten Island across the Narrows. It would have a main span of 4500 ft., the towers would be 800 feet high and the cables 48 in. in diameter, each comprised of 48,000 parallel wires. All ocean voyagers entering the port of New York would pass under this bridge—a fitting memorial to the American Expeditionary Forces in the World War

necessity of having a sll coat, lime coat and soap and lime lubricant for proper drawing, bright wire has a coating that has been drawn into the very surface of the steel. Necessarily this must first be taken off down to clean steel in condition to alloy with the galvanized coating. Therefore, the wire first passes through a heat treatment, not high enough to affect the structure of the wire, but enough to burn off this coating. One of the most suitable methods is a short immersion in a lead pan at a temperature of about 1000 deg. Fahr.

After the coating is burned off, the wire then passes through the second step in the process, a cleaning box, at least 20 ft. long, filled with dilute hydrochloric acid (4 to 6 per cent acidity) at a temperature of 150 to 170 deg. Fahr. Cleaning must necessarily be done by a rapid chemical reaction at the surface of the wire, because the wire is immersed in the solution only 15 sec. Next the wire enters a short box of hot water at about 200 deg. Fahr., for washing off any acid, and immediately dips into another short box containing a zinc chloride flux (or dilute hydrochloric acid of about 1 per cent acidity at a temperature 150 to 175 deg. Fahr.). At this point the surface of the wire must be free from all coating or dirt. A strictly clean surface is necessary for proper galvanizing. Furthermore, it is worth mentioning that there is less danger of acid brittleness at this point of bridge wire manufacture than just after the cleaning operation with sulphuric acid, because the bright wire has been subjected to the hydrogen of the acid for so short a time, 15 sec., in comparison to the many minutes required to remove the closely adherent fill scale from the wire rod. Assurance against acid brittleness at this point can be attained by placing a pre-heater between the acid cleaning and zinc pan, heating the wire to 400 to 450 deg. Fahr. before it is immersed in the molten zinc.

Lastly, the wire passes into the galvanizing tank. The zinc used should be of the highest quality, either electro-

lytic or Horsehead brand. The steel and zinc form a surface alloy, and is especially well bonded, because of the high carbon content of bridge wire. The zinc bath should have a uniform temperature throughout, closely controlled at from 880 to 900 deg. Fahr. About 15 ft. of the wire will be immersed in the zinc continuously; the time of immersion will vary with the speed. The exit "sinker" which holds the wire under the zinc will be of a roller type, for the reason that bridge wire is not run through asbestos wipers. Instead the wire leaves the molten zinc vertically, and passes up to sheaves placed approximately 25 ft. above the pan. On top of the molten zinc is a charcoal header with a six-inch bed of finely granulated charcoal mixed with beef tallow. This assures a smooth distribution of the zinc about the surface of the wire. To pass five immersions of the Preece test a minimum of 1.25 oz. of zinc per sq. ft. of surface must be evenly deposited on the wire.

The top sheaves previously mentioned lead to the blocks of the take-up frame, which are 60 or 72 in. diameter (as the erectors specify). Prior to shipment each coil should be tested to assure the purchaser that the wire meets his specifications.

### Conclusion

MANY improvements have been accomplished by the wire industry during the past few decades, particularly in the handling of material, equipment, wire drawing practice, temperature control and methods of inspection. Bridge wire is in a class by itself, however; it is to carry a live load, is subjected to exceptionally high and enduring stresses. Its manufacture requires, from the very first stages through to the final testing, the closest kind of supervision and coordination. The paramount aim and thought of the manufacturing organization must be for the "safety of the live load."

## Idea of Industrial Stimulation Pictured on Soviet Stamps

A SOVIET program for a production of 12,000,000 tons of pig iron in 1933 is announced by means of a graph which illustrates one of the most interesting postage stamp designs in the history of the hobby called philately.

Recently issued and now in use throughout Russia is some postal paper which, of industrial propaganda character, includes a 28-kopecs value, dark violet in color, picturing a blast furnace. Adjoining the furnace is a chart which shows the Soviet pig iron production to have been 4,200,000 tons in 1913, with a reduction to 3,200,000 tons in 1928. A column extends upward to a point marked 1933, and this column is inscribed "12,0"—significant of the purpose of the Soviet Supreme Industrial Council that in 1933 Russia shall produce 12,000,000 tons. "Pig Iron in Millions of Tons" is elsewhere inscribed, together with "Socialistic" and "Leveling Up." This design is one wholly unique to stamp collectors long familiar with their hobby's

kaleidoscope of postal vignettes. The idea of industrial stimulation is reflected in the designs of other denominations of the new set. A worker at his lathe is depicted on the 5-kopecs brown, and a line of tractors is shown on the 10-kopecs olive. On the 3-rubles stamp appears a hydroelectric plant.

The stamps were issued to attract the world's attention to the Soviet industrial loan. Stamps are enlarged in cut.



Calibration of testing machines, scales or other devices for measuring a simple tensile or compressive stress up to a total of 100,000 lb., can now be made to an accuracy of less than one part in 100,000 in a dead weight machine recently installed at the Bureau of Standards, Washington, and described in Research Paper No. 147.



# Estimating Galvanizing Pot Life

Quick Impairment Shown as Temperature Is Raised—  
Destruction at 950 Deg. 16 Times as  
Fast as at 850 Deg.

BY WALLACE G. IMHOFF\*

**W**HAT happens in a galvanizing pot at elevated temperatures has been brought out in the two first installments of this article (THE IRON AGE, Feb. 25, page 633, and March 27, page 933). The following paragraphs end the story and close with four specific thoughts or conclusions to be always in the mind of the practical galvanizer.

## Pots Live Fast Life at 1300 Deg.

Fig. 19 shows the sheet (all that is left of it) in the melt at 1300 deg. Fahr. Only the outlines remain, showing the top of the sheet protruding out of the melt. This plate clearly illustrates what will happen to any part of the galvanizing pot heated to 1300 deg. under practical conditions.

These investigations clearly show why pots fail in three days, a week, two weeks, a month or three months. They illustrate clearly the difficult problem which confronts the combustion engineer when he designs a galvanizing furnace. In 6 hr. the sheet has been entirely dissolved. A little rapid figuring at this point will give some interesting practical information.

The sheet, 28 gage O.P.C.R., was 1/64 in. thick. A firebox steel side of a pot is 1 1/4 in. (80/64 in.). It took 6 hr. to dissolve 1/64 in. On the same basis it would take 480 hr. (20 days) to dissolve the full-sized kettle if the temperature all over were uniformly at 1300 deg.

Fig. 20 shows a part of the melt with one of the large zinc-iron alloy crystals in it. These crystals are the result of the steel sheet dissolving completely in the zinc. This is a striking contrast to the previous illustrations of the melts. The answer to pot destruction has not only been given, but illustrated with pictures. The theory now becomes a valuable practical principle.

Fig. 21 shows the results

\*Consulting metallurgist, 401 Highland Building, Pittsburgh.

of the last test, made at 1500 deg. Fahr. The sheet is entirely gone; destruction is complete. It does not add anything to the principle now laid bare, but does clearly show that a higher temperature develops a larger zinc-iron alloy crystal and brings about quicker destruction. This is the last test and it now remains only to organize the results into useful practical principles.

What does it all mean from a practical standpoint? The results of the analyses of the melts will show more clearly what practical lessons can be learned. The complete analyses of all melts are shown below:

Temperature	Iron Content, Per Cent
800 deg. Fahr.....	0.0681
850 deg. Fahr.....	0.0614
900 deg. Fahr.....	0.1104
950 deg. Fahr.....	1.0050
1000 deg. Fahr.....	0.7132
1100 deg. Fahr.....	0.6618
1300 deg. Fahr.....	1.6738
1500 deg. Fahr.....	1.6590
Alloy cones at 950 deg. Fahr.....	4.24
Alloy cones at 1100 deg. Fahr.....	4.00

First of all, the results show that from 800 to 850 deg. there is practically no action of the molten zinc from the bath upon the steel base. To those who have worked many years around a pot in practice it is known that the action begins, or can be identified, at about 860 deg. It is also seen that, even as high as 900 deg., this action has increased only slightly. But the fact should not be overlooked that the intensity has practically doubled as compared with 850 deg. Considerably lower temperature than 900 deg. should therefore be maintained under practical conditions of operation, as the heat cannot be distributed uniformly over the entire heating area of the pot.

The significant fact is clearly shown at the temperature of 950 deg. The dissolving action is nine times as active as at 900 deg., and 16 times as active as at 850 deg. Basing the



**FIG. 19**—Commercial Slab Zinc with Steel Sheet in It Heated to 1300 Deg. Fahr., Held for 6 Hr. and Allowed Slowly to Become Cold. Complete destruction. Magnified 36 diameters



relation of the temperature and the power of destruction upon the iron dissolved at 800 deg., the following interesting table may be made for practical purposes:

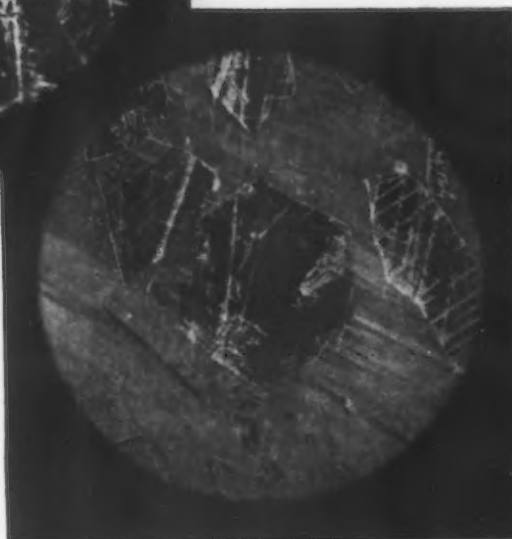
Temperature	Dissolving Power
800 deg. Fahr.	1.0
850 deg. Fahr.	1.0
900 deg. Fahr.	1.6
950 deg. Fahr.	14.7
1000 deg. Fahr.	10.4
1100 deg. Fahr.	9.7
1200 deg. Fahr.	24.5
1500 deg. Fahr.	24.3

A theoretical discussion of galvanizing pot destruction would not be complete without estimating the life of the pot at various temperatures. This now brings out the reason for using 36 diameters as a standard magnification for all melts. Knowing the thickness of a standard 28-gage O.P.C.R. sheet, the life of the pot at various temperatures can be roughly estimated. Allowance, of course, will be made for the difference in the character



FIG. 20 — Complete Destruction of the Steel Sheet, Showing the Final Results. A section through the melt exactly the same as all previous plates was made. 36 diameters (Left)

FIG. 21—Commercial Slab Zinc with Steel Sheet in It Heated to 1500 Deg., Held for 6 Hr. and Allowed Slowly to Become Cold. Complete destruction. 36 diameters (Right)



of the steel between the standard steel for 28-gage O.P.C.R. sheets and the firebox steel used for the sides of galvanized pots.

The standard thickness of a 28-gage O.P.C.R. sheet is 1/64 in. and it weighs 10 oz. to the square foot. A table of galvanizing pot destruction may therefore be constructed by measuring the size of the sheet at each temperature and basing the figures on these figures and the usual thickness of the kettle side, which is 1 1/4 in. It must be remembered that this table is not to be taken too seriously, but rather as an interesting application of theory to indicate

roughly what happens in practice. Those who have had pots fail in a very short time will be particularly interested.

The table is extremely interesting from a practical standpoint. To complete the estimates of pot life the data were carefully plotted. It was found from the curve that the destruction at 850 deg. Fahr. was about one-fourth of that at 900 deg. and therefore the 1/3072 in. loss was divided by 4, giving a value of 1/12288 in. loss an hour at 850 deg. Also, by closely estimating the results, it was found that only one-tenth of the action at 850 deg. took place at 800 deg. This gives, therefore, a loss hourly of 1/122880 in. as an estimated value.

The surprising fact of the whole investigation is how nearly theory checks with practice. The writer not long ago talked with a man who claimed his pot had been in service 12 years. Theory shows it to be possible if the temperature of the bath never had gone above 800 deg. The usual life of another pot is said to be 5 months, or 150 days. The customary operating temperature of this kettle is 860 to 880 deg. The bottom of the pot is probably always at 900 deg. The theoretical life at 900 deg. is 160 days. These facts check closely, and theory is not so far away from practice.

#### Conclusions

- 1.—The temperature of the bath is the most important single factor influencing destruction of galvanizing pot.
- 2.—The furnace design should be such that no part of the galvanizing pot where heat is applied should for any reason be heated above 900 deg. Fahr.
- 3.—The regular operating temperature of the galvanizing pot should always be as low as possible, and under no condition should be allowed to go above 875 to 885 deg.
- 4.—The temperature of all galvanizing baths should be indicated and recorded by an electric pyrometer.

#### Estimated Life of Galvanizing Pot with Firebox Steel Sides

Temperature, Deg. Fahr.	Thickness Lost per Hour, Inches	Estimated Life			
		1-In. Steel Side		1 1/4-In. Steel Side	
		Hours	Days	Hours	Days
800	1 122880	122,880	5,120	153,600	6,400
850	1 12288	12,288	512	15,360	640
900	1 3072	3,072	128	3,840	160
950	1 614	614	25 1/2	767	32
1000	1 1024	1,024	42	1,280	53
1050	1 896	896	37	1,120	47
1100	1 768	768	32	960	40
1150	1 672	672	28	840	35
1200	1 576	576	24	720	30
1250	1 480	480	20	600	25
1300	1 384	384	16	480	20
1350 1400 1450 1500	Hourly loss is greater, and the time of destruction becomes less as the temperature is increased; no theoretical data.				

# Rearrangement Adds to Capacity

Crane Maker Has Standardized All Units, Built New  
Office and Storage Structures and Revamped  
Handling System

**T**HROUGH a plant rearrangement involving a relatively small amount of new construction, the Box Crane & Hoist Corporation, Philadelphia, has made a considerable addition to its capacity. At the same time a new layout of the various departments, made possible by the new construction, together with the provision of special tools mounted on overhead cranes, has resulted in giving the company the ability to manufacture its product with a smaller force.

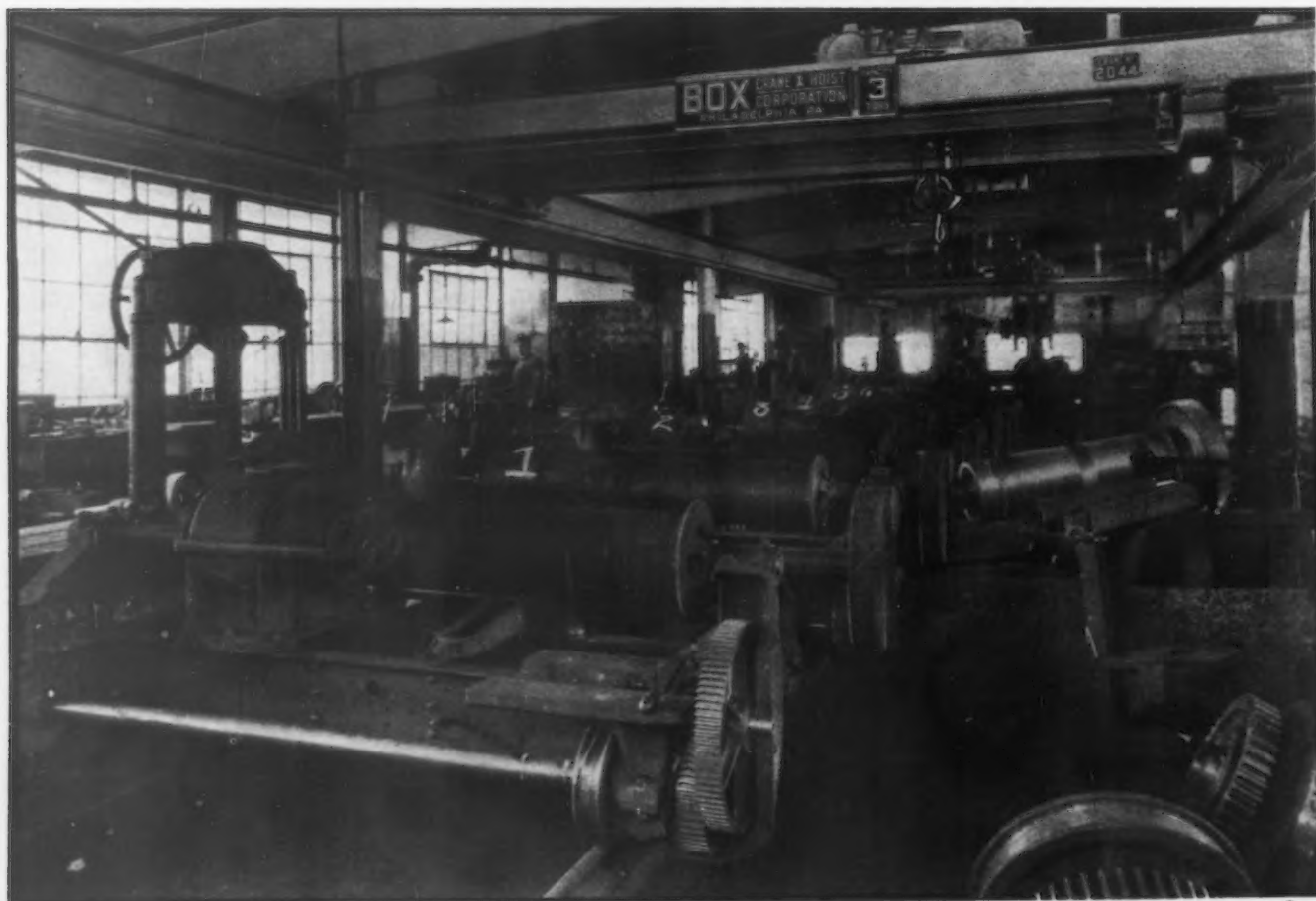
New construction comprises a two-story office building and a one-story storage building behind it, both being alongside the factory building and separated from it by a driveway. The space formerly occupied by the office (30 x 140 ft.) on the second floor of the east bay of the manufacturing building has been turned over to a parts assembly department, including testing appliances. At the same time a section

building formerly occupied by storage is now devoted to the heavy machining operations on trolley and other castings. This has released space in the central or assembly bay and added about 80 ft. to the length of the assembly space.

From a crowded office condition the change has been to one where spaciousness and opportunity for moderate expansion are at hand. The business office occupies the first floor and the engineering office the second floor of the building. Of particular interest in the latter is the method adopted for safeguarding drawings.

These are not in a vault but are stored in several fire-proof cabinets. In the interior of each cabinet are the usual large, shallow drawers. The exterior consists of a heavy oak frame covered with two layers of tin plate with about  $\frac{1}{2}$  in. of asbestos between them. The counterweighted doors (of same construction) on

**A**SSEMBLY Space for Crane Trolleys and Electric Hoists on Mezzanine Floor Was Formerly Occupied by the Office. A low-headroom crane serves this area, which measures 30 x 140 ft., and was designed for 400 lb. loading





the front may be raised easily, but are always closed at the end of the day. They are fitted with fusible links whereby they would be closed automatically in case of fire.

#### Several Definite Standards Set

Standardization of parts for the company's entire line of cranes, and extending even into the line of hoists, has involved considerable engineering work. Its advantages have already become manifest, however, although it has been in operation but a short period. In the whole gamut of cranes there are only seven sizes of bearings and in general no crane has more than three sizes on it. And the gears have been reduced to eight sizes as standard.

This change has resulted in some instances in placing on a unit a heavier gear or bearing than strict engineering requirements would have demanded. It has all been in the interest of greater durability, however, and is more than compensated for by lowered manufacturing costs.

Reduction in cost of production arises from the fact that the company can take advantage of what have been determined to be the most economical quantities to manufacture in any given lot. In gears, for instance, there may be 250 to 1000 made without changing the machine set-up. This is far less expensive than the previous method whereby 25 or 50 were made at one set-up. The same condition is true in other matters.

#### Minimum Handling in Assembly

Large cranes—those with 40-ft. span and upward—are built in one place without being moved about. This obviates the necessity for transporting members from one place to another, with the large amount of cross-hauling thereby occasioned.

Two angles are spot welded along the upper and lower

### ALL Electric Hoists Are Tested Under Their Own Power on Testing Rig in Right Foreground.

Meter and efficiency tests are run on each unit

edges of each of two cheek plates, which have been cut to shape. Then one plate is laid on top of the

other and all the rivet holes to connect the plates and angles are drilled through the four thicknesses at once. This saves a large percentage of the time formerly required for this operation. At the same time, the rivet holes for the transverse spacing members are drilled through the two plates at once, instead of through each one separately.

Then the cheek plates are set up on edge and spaced far enough apart to take the transverse members. They are riveted top and bottom and the transverse members then riveted to the plates. The top cover plate is then spot welded in position and rivet holes drilled through that plate and the marginal angles at a single operation. These rivets then are driven. The entire member then is turned over and the bottom cover plate has the rivet holes drilled and the rivets set in the same manner. Thus the whole job of making each girder is done in the one space and with a minimum of handling.

#### Getting the Product Out More Quickly

A certain amount of standardization has taken place, even in the members just mentioned. On some sizes of cranes for certain spans, plates and angles heavier than the engineering design calls for are used. This reduces the amount of stock carried in the yard, and the added cost of the added weight of material is compensated for by the smaller inventory.

By a combination of these methods of manufacture and standardization the company has been enabled to build cranes in shorter time than previously, and thus to ship them to customers more quickly after receipt of order. A large crane is now built in about four weeks, and in a few instances it has been found possible to ship such a unit





within 14 working days.

There has been a certain increase in the inventory of standardized parts, based upon the fact that there is a much larger production, in each lot, of any given part. Some of the gears, etc., which are produced in lots of 250, are the subject of production orders whenever the stock has reached a definite minimum—say 25 pieces. Thus, the inventory fluctuates between 20 or 25 of a given size and perhaps 275, with an average of about 150.

The extra cost of carrying an inventory of this size, however, is felt to be more than covered by the reduced manufacturing cost and at the same time there is a quicker operation of the shop, getting the crane out in a day or two days shorter period than formerly and getting the money back for it correspondingly more rapidly.

#### Working Tools Suspended from Cranes

One particularly interesting feature of the new layout, but which is independent of the layout as such, lies in an arrangement whereby drills, riveters and other manufacturing tools are carried on light overhead cranes which themselves have the necessary hoists for handling, turning over, etc., the material being worked upon. This permits one man operating such a crane to do the entire job, whereas formerly four or five men frequently were needed.

These special tools were designed (and built) by the company and have been subject to considerable development in the brief interval since they were first put to work. Such a saving has been made by this means, and by the reduction of handling requirements inherent in the new layout, that the total force for the present output is only about one-half that which would otherwise have been needed.

All hoist assemblies are tested by means of actual weights applied to them. On the balcony (the former office

**I**N the Light Structural Assembly Bay Are Two Special Combination Drills, Cranes and Hoists. Several such units are employed along the 150-ft. length of this bay. These rigs permit one man to do layout, drilling and assembly without assistance of helpers

space) the test section makes use of a trunk hole cut through the floor, the weights being put on below. Thus both capacity and speed of operation of

the hoist may be determined for each unit, before shipment.

Many of the small cranes now being made, such as those operated from the floor but with power hoists, are entirely welded. There are exceptions to this condition, of course, in those joints which require field assembly. Aside from these particular features, however, the welding of the crane is complete. For this purpose three portable welding units are employed, which may be moved to any place where needed and plugged in on a power circuit.

#### Welded Ship 25 Per Cent Lighter

**T**WO all-welded oil tankers (600 tons displacement) were recently built by Deutsche Werke, Kiel, Germany. The boats are 133 ft. long, 27 ft. beam and 13 ft. draft. Each has three oil tanks amidships, and 70-hp. Diesel engines aft. Since the owner insures its own vessels, many innovations in the design were permissible. Compared with an equivalent rivetted vessel meeting the German Lloyd specifications, the welded tanker required 145 tons of structural steel and plating, and the rivetted tanker 208 tons. Bulkheads were reduced from 8 mm. to 7 mm. thick, and much weight in corner and framing angles was saved. Despite the fact that welding was done on a covered way, erection costs per ton were higher; nevertheless the saving in steel counterbalanced the added cost of welding. Shell and deck plating were welded in transverse belts across the ship, as the usual need for staggering joints no longer existed. The deck was made without sheer or camber.

# Business Indications Not Conclusive

## Forecast Value of Present Stock Market Revival Still Undetermined—Easy Money Is A Passive Factor

BY DR. CHARLES O. HARDY

THE business history of the past month contains little that is fresh or startling. There has been no striking recovery of commerce or industry from the depressed conditions that have characterized the past few months; neither has there been any noteworthy change for the worse. Some lines of productive activity were slightly better in March than in February, and others were slightly worse, but when allowance is made for normal seasonal tendencies and the greater number of working days in March the balance is slightly unfavorable.

Steel ingot production per day fell off by some 3 per cent; pig iron production gained about the same amount. Automobile production increased from February to March by over 15 per cent and new passenger car registration in about the same proportion, but this is probably no more than a normal seasonal gain. The March output was lower than that of any March since 1925.

Building contracts show a large gain over February, but here, as in the case of automobiles, it is difficult to say how much allowance should be made for seasonal fluctuations, as the distribution of the business through the seasons varies greatly from one year to another. Commercial, industrial and public building is making a very good showing, but residence construction (unfortunately the largest item) is running at a level about 50 per cent below the records of the years from 1925 to 1928. Power production, freight car loadings and employment reports continue to reflect subnormal activity. Prices, however, have gained stability during recent weeks, especially those of basic raw materials.

### Recession Less Severe Than Two Predecessors

THE current recession has now run far enough to enable us to form some judgment of its severity as compared with other business reactions of recent years. The accompanying table and chart will give an idea of the relative severity of the current depression and the two previous recessions. It must be remembered, of course, that comparing a single

Present conditions are worse than at the bottom of the 1927 depression, but better than in 1924.

\* \* \*

It is too early to appraise the significance of the stock market revival.

\* \* \*

Stock market recovery usually precedes business revival, but not all swings on the exchanges are followed by comparable changes in business.

\* \* \*

The collapse of a premature stock market boom would shake public confidence.

\* \* \*

Cheap money makes it easier for business to revive, but it can do little to start recovery.

month with the corresponding month of the preceding year gives only a rough idea of what has taken place. Moreover, in some cases, as with building, the figure for last year used as a basis of comparison was itself rather below normal, while in other cases, such as the figures of automobile production and ingot steel figures, the comparison is with months of extraordinary activity.

It is clear that the current recession is decidedly less severe in comparison with conditions in other years of declining activity than is generally supposed. The spectacular fashion in which the depression started last fall has made the course of business activity the center of public attention, whereas in 1924 and 1927 the recession of business came on so gradually that it was never front page news and its character was only dimly perceived, even by many of those whose incomes were directly affected.

If there are no further material losses in the rate of industrial ac-

tivity, and if recovery occurs without a more prolonged period of marking time than has occurred in other post-war depressions, the indications are that the loss of national income resultant from the slowing down of activity will be of the order of magnitude of those of 1924 and 1927. Conditions are now probably a little worse than at the bottom of the 1927 depression, but much better than in the late spring of 1924.

### Stock Market Suggests Business Recovery

THE center of interest has shifted once more from business news to the doings of the stock market, which is enjoying an extraordinary revival of activity. Prices of speculative leaders are now above the levels of a year ago—prices which were then already of unprecedented height, and the ticker is again running 20 min. behind the market. Moreover, these prices were then supported by the enthusiasm of a prolonged trade boom, whereas now the market has to overcome the handicap of trade depression.

This phenomenon, however, is not unprecedented. After nearly every major trade recession the stock market has started recovery while business activity was still at a low ebb, and usually the converse has been true also, that is, the stock market has turned downward while production and trade records were being broken.

Whether this tendency for changes in the trend of the stock market to precede the swings of business activity is due to the fact that those shrewd investors who see the changes furthest ahead begin buying or selling before the public is aware of what is going on, or whether stock market upswings and downswings cause corresponding changes in trade activity, or whether both the stock market changes and the industrial changes are due to common causes, which show themselves quicker in the stock market than in the commodity market—such as tight and easy money—is a question on which students of cycle theory have reached no agreement.

Whatever the reason, it is clear



that changes in the rate of business activity are typically preceded by similar changes in the trend of the stock market. In 1929 productive activity was already easing off before the stock market boom was checked, and in 1927 the downswing of business was not signalled by the stock market, but such cases are highly exceptional.

#### Not All Stock Market Swings Significant

LIKE most "business barometers," however, the stock market indicator has a flaw. Not every considerable swing in the stock market is followed by a comparable change in business conditions. The stock market has extra swings, such as the downward trend through 1917 and the big break in the spring of 1926, which do not correspond to business cycles. Moreover, in every major stock market movement there are reactions against the main trend, often lasting for a month or two, which cannot be told from major movements until afterward. It is impossible, therefore, to identify the significant turn-

crease of brokers' loans and the enormous turnover of stocks, obviously professional in character, do nothing to reassure us on this point. And, if we should have another stock market collapse, its adverse effects are likely to be more serious than usual, because we have never had a depression in which so much public attention was being given to the stock market as a business factor.

#### Cheap Money Cannot Prime Business

A SECOND factor generally regarded as favorable is the ease of money. Short-time loans on good security are cheaper the world over than they have been since 1924; in many countries cheaper than they have been since the war. Whether this cheapness is regarded as a favorable or unfavorable factor is a question of point of view. In large part it is a direct result of the slackening of business activity.

Commercial loans have declined in volume, and this decline has not been compensated for by an expansion of other demand. In so far as this is a factor, cheap money is an index of

of banks to lend and of business men to borrow to expand investment and inventory in the face of uncertainty as to their markets.

While it is the writer's opinion that the causes of this depression lie on the surface and that recovery will be evident in the course of a couple of months, his belief is not strengthened by the events of the past month. Nothing has happened that clarifies the situation except the cheapening of money and the revival of the stock market. The risk of a new shock to public confidence, from the collapse of a premature stock market boom, is greater than the prospect that the cheapening of money will hasten the return of prosperity.

#### Consider Specifications for Alloy Steel Castings

To meet a need for the rapid development in recent years of heat-treated alloy steel castings, the subcommittee on steel castings of committee A-1 on steel of the American Society for Testing Materials is seriously considering the advisability of preparing specifications for this material. The present A. S. T. M. specifications are intended to cover only carbon steel castings. While there is some demand that specifications should be drawn up covering the physical properties of heat-treated castings made of various alloy steels, it is contended that practice in the manufacture of castings of this type is changing so quickly that specifications, if prepared, would soon be obsolete.

At the request of committee A-1, a communication has been addressed to the following organizations seeking their views as a guide to the further consideration of this subject: American Railway Association, American Electric Railway Association, American Foundrymen's Association, American Society for Steel Treating, National Electric Light Association, American Petroleum Institute, American Society of Mechanical Engineers, Steel Founders Society of America, Canadian Engineering Standards Association, Bureau of Construction and Repair of the Navy, and the Army Ordnance Department.

Views of members of the society are also solicited by the committee as to the need of such specifications at this time. If the need develops, information is also solicited on the type of application for these castings for which specifications are desirable and whether rejection limits for physical properties and chemical composition should be included.

Greenfield Tap & Die Corporation, Greenfield, Mass., is one of the first New England companies to adopt airplanes in the promotion of business. At present Harry Soper and F. H. Payne, officers of the company, are visiting Atlanta, Ga.; Memphis, Tenn.; New Orleans; Tulsa, Okla.; Indianapolis and Detroit in a plane owned by the company.

Percentage Changes in Business Activity, 1923-24, 1926-27, 1929-30

Item	May, 1924, from May, 1923	Nov., 1927, from Nov., 1926	Change in Latest Month Available from Corresponding Month, 1929
Manufactures, production of.....	-16	-8	-10 February
Factory employment.....	-11	-5	-4 January
Mineral production.....	-10	-15	-11 February
Car loadings.....	-7	-10	-9 March
Steel ingots.....	-37	-16	-15 March
Pig iron.....	-33	-18	-12 March
Automobile production.....	-19	-48	-36 March
Building contracts.....	-4	-2	-5 March
Cotton consumption.....	-33	+7	-20 February
Woolen consumption.....	-39	-3	-20 February
Shoes, production of.....	-19	-3	-8 February
Department store sales.....	-2	-1	-2 February

ing points until we are well past them.

Considerable recoveries in the middle of major slumps, which have no business significance, are very common. For example, in 1919-1920 the New York Times index, after falling 25 per cent between November and February, got back at the end of March to within 6 per cent of its high for all time, but a few months later it lost all this ground and much more. Likewise in 1907 there was a strong recovery between the two big breaks of March and November. Some months after the panic of 1893 stocks advanced 20 per cent in two months without any corresponding business recovery, then slumped off again.

It is too early, therefore, to predict the early end of the depression on the basis of the stock market's behavior. Precedent seems to indicate that if the present stock market revival proves permanent, business will get no worse and will get much better within four or five months. But precedent gives no ground for assuming that the stock market will not have another sinking spell.

The concentration of interest in speculative favorites, the rapid in-

unfavorable conditions, though it does contribute something to overcome those unfavorable conditions. It is like low wages or low prices of raw materials. They result from slackness in business; they make it somewhat easier for business to recover.

The other factor in the cheapness of the money market is banking policy. The Federal Reserve system has been energetically pouring credit into the market by buying securities, and this process has not had its normal result of driving gold out of the country because the central banks of other countries have been doing the same thing. Instead of the scramble for gold, which has been the bugbear of economists since the end of the inflation period, we are witnessing a flight from gold.

The most that can be said for this policy as an index of future business prosperity is of a negative character. Tight money could hinder a business revival, cheap money manufactured in this way can do little to start it. Money created by central bank expansion will lower the yield on the best bonds and make commercial borrowing cheaper for strong firms able to borrow in the open market, but it does little to overcome the hesitation



## Electrically Welded Tubing Without Stitch

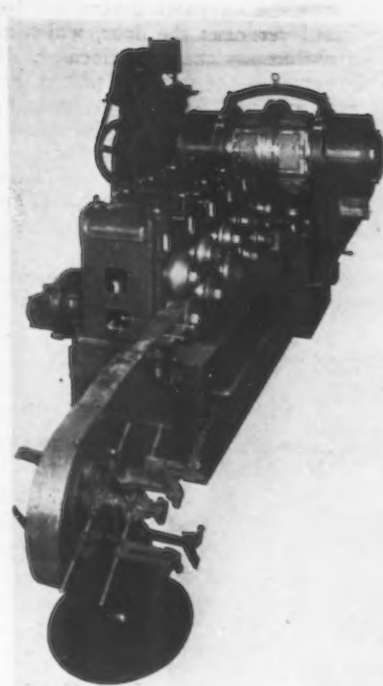
IN the manufacture of tubing in which flat skelp is formed into a tube and then electrically welded, an alternating current has been used. Although successful at low speed, these welders did not prove so at speeds in excess of 60 ft. a minute, owing to the fluctuation in temperature occasioned by the frequency of the alternating current.

This weld is in the form of a so-called "stitch"—a welded spot at the highest point of temperature, followed by an unwelded portion, governed by the frequency of the alternating current. For example, welding tubing at 60 ft. a minute, with alternating current at 60 cycles, the current fluctuates 7200 times a minute. With each alternation the current increases to maximum and decreases to zero. Thus, at 60 ft. of weld a minute, or 720 in., the "stitches," or recurrent variations in welding, appear along the tube approximately every tenth of an inch.

To eradicate the stitches, an electric welding unit has been brought out by the American Electric Fusion Corporation, 2610 Diversey Avenue, Chicago.

Instead of utilizing alternating current directly for welding, this unit utilizes that current for driving two 35-hp. motors directly connected to an acyclic generator, generating approximately 2½ volts, and capable of delivering currents up to 20,000 amperes.

The arrangement of the generator is such that delivery of welding current is made directly to circular bus bars which surround the stator of the generator. The welding rings are directly attached to these circular bus bars. Thus, while the rotor of the generator rotates at a high rate of speed within the generator frame, the



Motors and Generator at Upper Right Provide Direct Current for This Welding Machine for Pipe

frame itself rotates slowly over the seam of the tube as it passes beneath the generator.

On preliminary trials, speeds as high as 200 ft. a minute were readily obtained with this unit. It is believed there is no reason why, with increased excitation and increased horsepower, speeds could not easily be obtained which would be double those reached on preliminary trials.

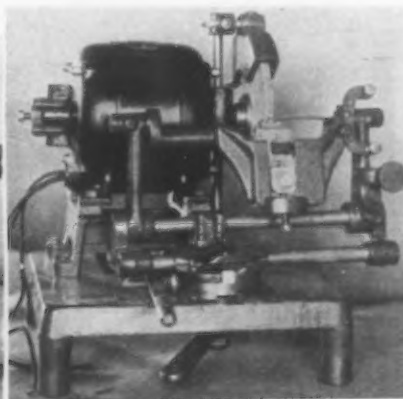
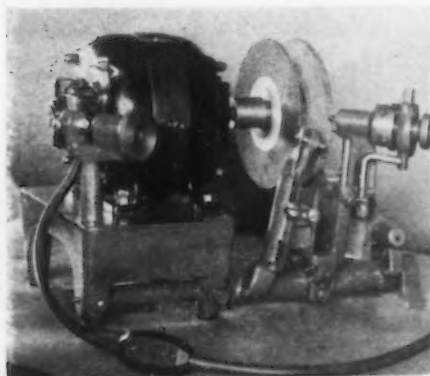
The picture shows the generator as mounted in conjunction with the forming machine, on which the trials were carried out. As the current is non-fluctuating, the welding temperature is likewise non-fluctuating, producing a smooth, continuous weld.

## Motor-Driven Drill and Cutter Sharpeners

NEW drill and cutter sharpening machines equipped with motor drive have been placed on the mar-

ket by the Wells Mfg. Co., Greenfield, Mass.

The drill sharpener, shown herewith, is intended for drills of ¼-in. diameter and smaller. It is motor driven, a 1/6-hp., 110 or 220 volt



The Drill Sharpener (at the left) Is for Drills ¼-In. in Diameter and Smaller. In the cutter grinder, (at right) the cutter is mounted on the trunnion holder which is swung to permit grinding cutter teeth to required radius

motor being employed. The drill to be ground is mounted in a draw-in chuck which is held in a quill. In operating the machine the tool is inserted lightly in the chuck and the quill then slid into the lining-up holder at the left of the machine. This fixes the drill in the correct position; the drill and quill are then inserted in the grinding fixture shown at the right. A cam and swing motion serves to sharpen the drills correctly and rapidly. The drill is held in a fixture for thinning the point, which is done on a thin emery wheel. Equipment includes a diamond truing device and a rack to hold the spring chucks.

The cutter sharpener, also illustrated, is designed for circular cutters ranging from ⅜ to ½-in. in thickness and from 2 to 4-in. in diameter. A fixture can be made to take larger cutters. Operation is simple, the cutter merely being swung in front of the emery wheel. There is an index that rests on the tooth being sharpened. A diamond truing attachment is furnished.

## Safety Platform Ladder

SAFETY platform ladders of new design are being offered by Patent Scaffolding Co., Chicago. This ladder provides a hardwood platform 2 ft.



The Inclosed Platform Permits User to Move About Without Danger of Misstep

from the top, the standing surface being inclosed on three sides, so that the user can move about freely without danger of a misstep and consequent fall.

The ladder can be ascended at back as well as at front when occasion requires. The round back rungs are spaced the same as the steps in front. Airplane spruce is used because of its lightness and strength. Steel knee braces and tie rods supply the double-step bracing system. Tool holders and a nail pan are built into the top of the ladder.

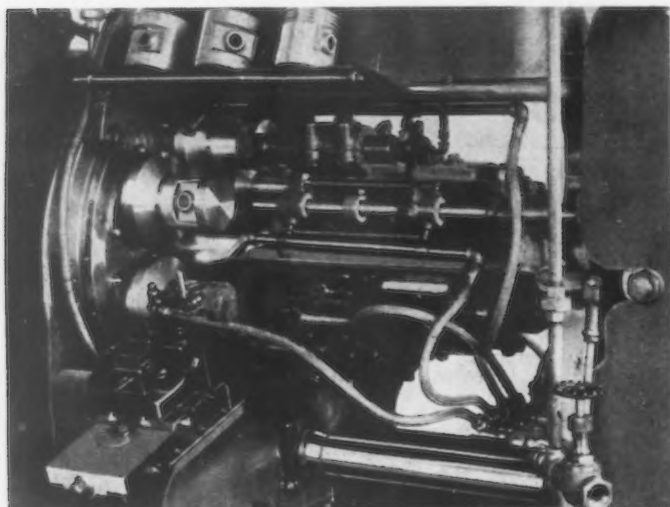
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FOR machining automobile piston castings on the six-spindle horizontal chucking machine built by the Baird Machine Co., Bridgeport, Conn., the set-up illustrated has been devised.

The piston is carried successively to the five working stations where the skirt, the grooves and the end are rough and finish turned in the one

machine the operator places his foot on the lever near the floor, which action withdraws the work locator. He then removes the pin and piston, and locates another casting against a circular part of the face of the spindle. He then slips the pin in place, removes his foot from the foot lever, the work locator holding the piston until it is firmly grasped by the automatic holding fixture.

Connected with the work locator there is a safety control device which



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handling. In turning the end the tool is removed from the surface so that no tool marks mar the end of the piston. The skirt of the piston is turned with a slight taper. Floor to floor time per piston ranges from 15 sec. up, depending upon the material to be turned, size of piston and amount of stock to be removed, kind of tools and the speeds and feeds that can be used.

The piston casting is held in the spindle by a fixture using a pin that passes through the wristpin holes and into a corresponding hole in the fixture. In unloading and reloading the

prevents indexing of the turret while the foot lever is held down. Thus the operator is safeguarded while loading and unloading and damage to tools is practically eliminated. The machine can also be provided with a stop which automatically stops the machine after a cycle of operations. This prevents the work from passing through the machine a second time in case the operator has not attended to the unloading and reloading. The act of reloading automatically releases the automatic stop. The Baird chucking machine was described in THE IRON AGE of Nov. 7, 1929.

## Electric Hoist Has Alloy Metal Frame

A COMPLETE line of electric hoists in sizes ranging from  $\frac{1}{8}$  to 7½-ton capacity has been put out by the hoist and crane division of Robbins & Myers, Inc., Springfield, Ohio. Outstanding features incorporated in these hoists are:

A radical change in design, with resultant saving of both weight and space in all dimensions, headroom included; a cast steel trolley adjustable to nine sizes of I-beams; a safety-constructed inclosed bottom block, which retains the rope on the sheaves and shrouds all parts, so as to guide itself easily into the rope flare when swinging.

Gearing of alloy steel, heat treated to rigid specifications, which allow for the maximum strain of constantly re-

versing tooth loads at top motor speed; Hyatt roller bearings in the hoisting mechanism.

A main frame of Aremite alloy



metal, produced in the Robbins & Myers foundry by electric process, with a tensile strength of 35,000 lb. to the square inch, with an elasticity that enables it to stand shock more readily than cast iron, and a better finished appearance than cast steel.

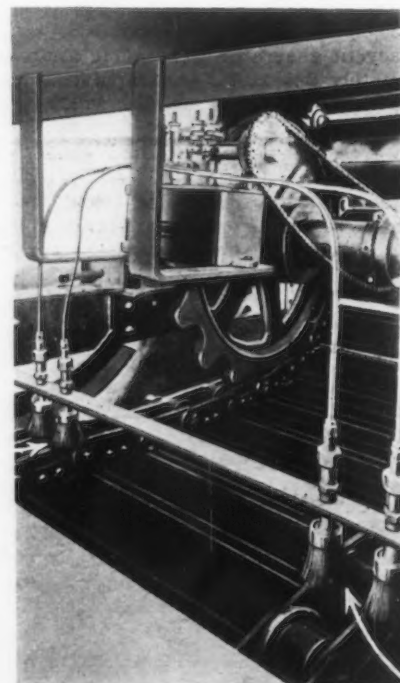
An aluminum finish, applied throughout, which makes for attractive appearance and provides lasting protection against damage from exposure.

## Force Feed Lubrication of Apron Conveyor

POSITIVE lubrication of a heavy duty apron conveyor used for carrying filled and empty drums has been provided by means of brushes. The lubricator is mounted on the under or slack side of the conveyor. Oil is forced, by the pump, to the brushes through  $\frac{1}{4}$ -in. copper tubing.

As each link in the chain passes beneath the brushes it is coated with a film of oil. The lubricator is a four-feed unit, driven by sprocket and chain from one of the main drive shafts. The device is made by the Hills-McCanna Co., 2349 Nelson Street, Chicago.

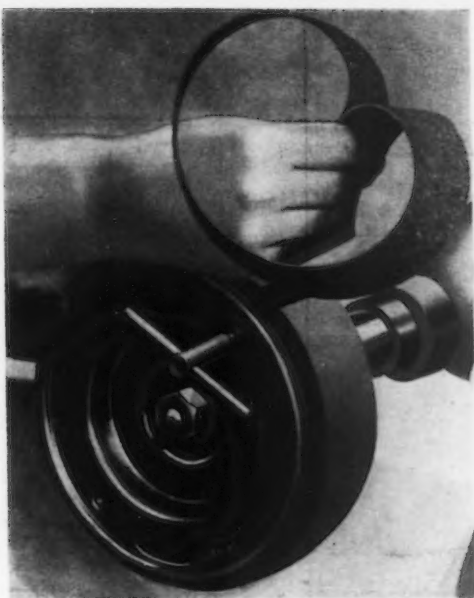
Units are built in several sizes, ranging from pint capacity single-



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feed units, for use on small equipment pumps and the like, to large units having as many as 60 feeds. These units may also be mounted tandem fashion, operated by a central driving unit, thereby increasing the number of feeds to any desired quantity. These larger units permit lubrication of several related machines at regular intervals, with predetermined amounts of oil.





### Polishing Wheel Features Ready Application

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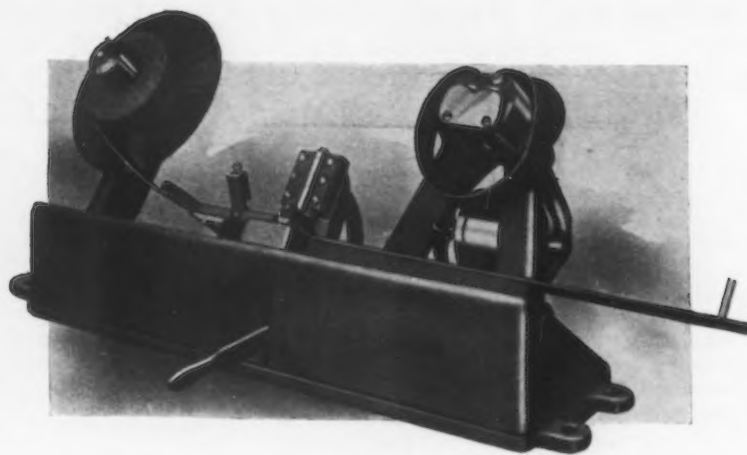
The wheel is made up of stamped steel sides pressed to a heavy steel drum, the face of which is covered with thick rubber. The rubber face is cured on to the drum, but may be replaced when worn out or damaged. It has a slight crown to permit best results when the wheel is compressed against the work. The construction is said to be such that the parts of the wheel cannot loosen, break or "blow up," while smooth running of the entire assembly is assured by the accurate balancing of each wheel before shipment. Attaching the wheel to the polishing machine spindle merely involves the tightening of a nut, and applying or removing the abrasive cloth can be done in 30 sec., without removing the wheel from the spindle.

Three sizes of the wheels, 6, 8 and 12 in. in diameter, are made. For use on portable tools the wheels can be furnished with a  $\frac{1}{2}$  in. or a  $\frac{3}{8}$  in. diameter bore, while for stationary polishing heads and small grinders the wheels can be supplied with arbor holes from  $\frac{1}{2}$  to 2 in. in diameter.

The abrasive cloth can be supplied in clipped strips ready to be applied; in proper lengths without clips; or in the form of rolls. The latter are furnished primarily for the combination cutter and clipper here illustrated, which has been designed for large users of these polishing wheels. This machine cuts the abrasive cloth to proper length and compresses the patented metal joining clips to the ends under heavy pressure. Production is at the rate of 300 cut and clipped strips an hour. An advantage claimed for abrasive cloth in roll

form is that cracking and forming of high spots on the wheel is eliminated.

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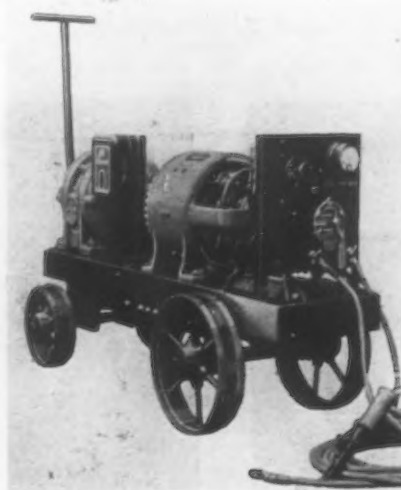
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Another feature of this wheel is the wide buffing or polishing surface obtained. For flat work the full  $2\frac{1}{2}$ -in. width of the abrasive cloth is available except for the  $\frac{1}{8}$  in. that extends beyond each side of the rubber face. However, these edges of the cloth are usable on beading work.

Before shipment the wheels are tested at speeds up to 8000 r.p.m., although they are intended for use at speeds ranging from 3500 to 5000 r.p.m., which speeds are recommended as the most efficient.

### Lightweight Arc Welder

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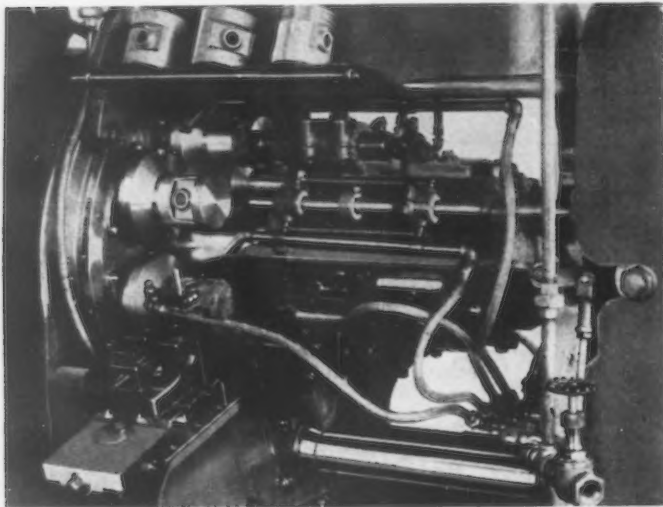
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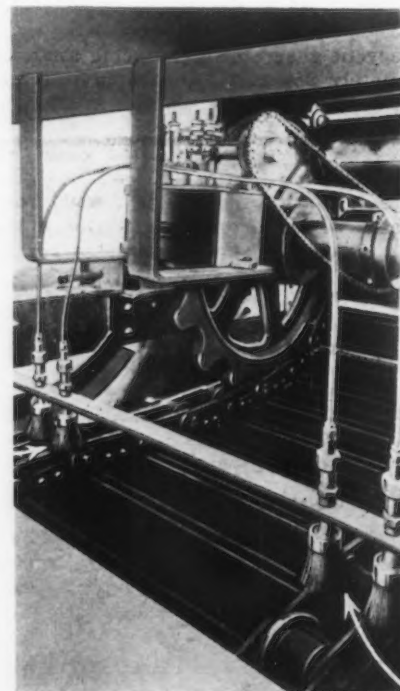
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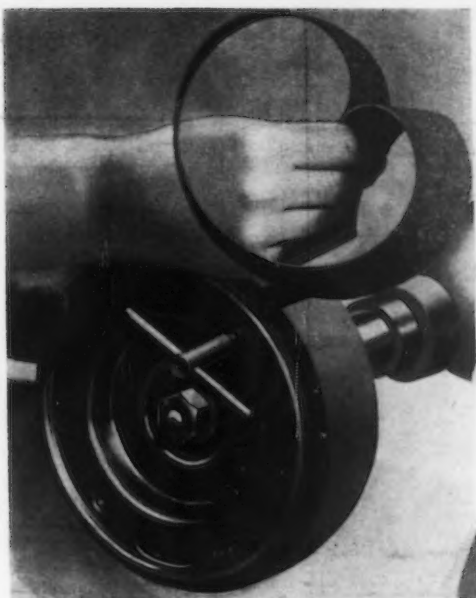
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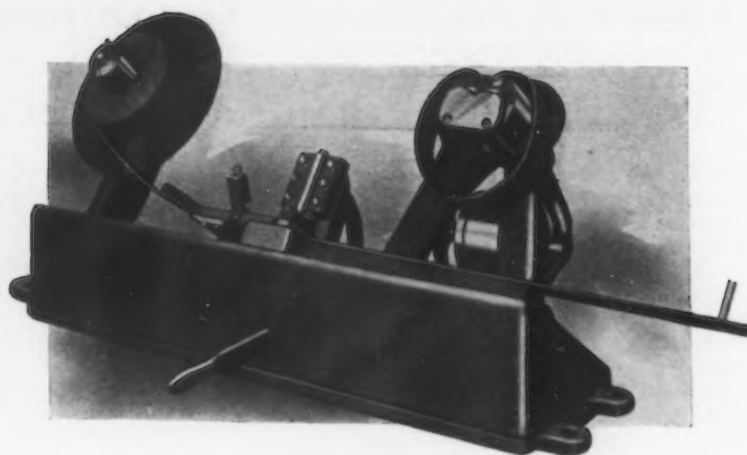
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# Republic Steel Names New Officers

## Four Vice-Presidencies Created with Benjamin F. Fairless as First Vice-President—Other Announcements Soon

FOUR new vice-presidencies have been created in the Republic Steel Corporation, following the announcement last week of the election of Tom M. Girdler as chairman of the board, and Elmer T. McCleary as president.

Benjamin F. Fairless, who was president of the Central Alloy Steel Corporation, has been made first vice-president of the Republic company.

R. J. Wysor, formerly general manager of the Jones & Laughlin Steel, who resigned to become associated with the Eaton interests at the time that Tom M. Girdler joined this group, becomes vice-president in charge of operations of Republic.

Rollin S. Hall, who was president of the Bourne-Fuller Co., and William P. Witherow, who was president of the Witherow Steel Corporation and later chairman of the Donner Steel Co. after its merger with Witherow, are also made vice-presidents.

Harry T. Gilbert, who was vice-president in charge of sales of the Republic Iron & Steel Co., continues in the same capacity with the new Republic company. Other Republic officers who retain their same positions with the Republic Steel Corporation are Richard Jones, Jr., secretary, and John U. Anderson, treasurer.

### Directors Number 15

The new board of directors of the Republic Steel Corporation, consisting of 15 members, has been elected as follows:

Tom M. Girdler.

Charles F. Glore, member of Field Glore & Co., director of Montgomery Ward & Co. and of Bucyrus-Erie Co.

Edward B. Greene, chairman of executive committee of Cleveland Trust Co., director of Cleveland-Cliffs Iron Co., of Goodyear Tire & Rubber Co., Republic Iron & Steel Co. and of the Cleveland-Cliffs Corporation.

F. J. Griffiths, chairman of the board of directors of Central Alloy Steel Corporation.

John T. Harrington, president and director of Pennsylvania Ohio Power & Light Co., director of Republic Iron & Steel Co., director of Penn Ohio Edison Co., director of Allied Power & Light Co.

Frank H. Hobson, vice-president of Cleveland Trust Co. and of Continental Shares, Inc.; director of Central Alloy Steel Corporation and of Lehigh Coal & Navigation Co.

George M. Humphrey, president and director of M. A. Hanna Co., director of Republic Iron & Steel Co.

Paul Llewellyn, president and director of Interstate Iron & Steel Co.

E. T. McCleary.

William G. Mather, president and director of Cleveland-Cliffs Iron Co., director of Otis Steel Co., director of Republic Iron & Steel Co.

Jacob F. Schoellkopf, Jr., vice-president and director of Schoellkopf, Hutton & Pomeroy, Inc.; director of Continental Shares, Inc.; director of Insuranshares Corporation, director of Niagara Hudson Power Corporation, director of Great Lakes Portland Cement Co., director of Donner Steel Co., Inc.

Boylston A. Tompkins, vice-president and director of Bankers Trust Co., director of Central Alloy Steel Corporation, of Detroit Edison Co. and director of North American Aviation, Inc.

John A. Topping, chairman of board

## Officers of the New Republic Steel Corporation



T. M. Girdler  
Chairman



E. T. McCleary  
President



B. F. Fairless  
First Vice-President



H. T. Gilbert  
Vice-President in Charge  
of Sales



R. J. Wysor  
Vice-President in Charge  
of Operations



W. P. Witherow  
Vice-President



Rollin S. Hall  
Vice-President



Republic Iron & Steel Co., director Bankers Trust Co.

Myron A. Wick, president of Steel & Tubes, Inc.; member of executive committee and director of Republic Iron & Steel Co.

Phillip Wick, partner Wick & Co., director of Central Alloy Steel Corporation, director of Republic Iron & Steel Co., director of Continental Shares, Inc.

Other announcements as to operating and sales personnel, including the names of district sales managers and their assistants, will be made within a week or two.

Formation of the Republic Steel Corporation is now completed, it was stated by Tom M. Girdler, chairman.

Details were concluded in New York last week at a meeting of officers of the company. Otis & Co., bankers, last week announced that an issue of \$60,000,000 of 6 per cent convertible preferred stock had been fully subscribed.

"Our merger coincides with an upward trend of steel operations," Mr. Girdler said, "and should bring numerous advantages to Republic Steel. Steps are being taken to coordinate Republic's purchasing, selling and shipping. Operations of Republic are being redistributed into geographical districts. Sales offices of the merged companies are being consolidated."

cided quickly, although efforts probably will be made to obtain decisions as soon as possible because of the fact that merger contract between Sheet & Tube and Bethlehem has a time limit, and, if the legal questions are out of the way in time, this contract will have to be renewed. It is likely that the question will be raised by the merger opponents that a renewal of the contract will require another vote of the stockholders.

Other obstacles to the merger which have been raised by its opponents are the possibility that the courts may uphold Mr. Eaton's contention that stock transferred since the record date (March 22) should not have been voted, and the possibility that law violations may be found by the courts, as charged by Mr. Eaton, in the purchase of stock with proxies.

## Youngstown-Bethlehem Merger Ratified

### Legal Complications, However, May Delay Consummation of the Plan—Department of Justice to Investigate

**S**TOCKHOLDERS of the Youngstown Sheet & Tube Co. ratified the proposed merger with the Bethlehem Steel Corporation on Friday, April 11, after a protracted session which had been interrupted by court proceedings. The vote was 857,821 shares in favor of the merger and 341,791 opposed or not voted at all. The number necessary for the plan to win was 799,141.

Final consummation of the merger, however, may be delayed indefinitely pending the outcome of litigation instituted by the opponents, headed by Cyrus S. Eaton, of Otis & Co., Cleveland banking firm.

Eugene G. Grace, president of Bethlehem, stated that "every latitude of time will be allowed on our part to obtain authoritative determination of every legal question involved. There is no doubt in our minds as to what the courts will decide, and every possible legal technicality must be disposed of before the plan can be consummated."

James A. Campbell, chairman of the board of the Sheet & Tube company, said that "the terms of the contract are such as to allow ample time for the unraveling of legal complications."

#### Fight to Go On in Courts

Meanwhile, Mr. Eaton announced that the fight against the merger would be carried on in the courts and that he had confidence that "the courts will confirm the fact that the merger has been clearly and definitely defeated."

Failing in an effort to obtain an injunction in the Federal court in Cleveland to prevent the holding of the special stockholders' meeting that was called to vote upon the merger plan, the merger opponents started an action in the Common Pleas Court in Youngstown to prevent the voting of about 51,000 shares of Youngstown stock, which Otis & Co. had purchased but for which proxies had been given

to the merger proxy committee by the former owners.

Judge Turnbaugh of the Common Pleas Court dismissed this action on a technicality, but a similar petition was filed by Myron C. Wick, Jr., one of those opposed to the merger, and Judge Turnbaugh issued a temporary injunction, which he later dissolved, permitting the issue to go to a vote on Friday last.

In his decision, Judge Turnbaugh emphasized that, in dismissing the injunction, he had in mind the statement of Newton D. Baker, of counsel for the merger faction, that the merger would not be consummated while litigation is pending. A legal battle which may stretch out over a considerable period seems to be in prospect.

Counsel for Cyrus S. Eaton filed an appeal from Judge Turnbaugh's decision with the Appellate Court at Lisbon, Ohio, and it was intimated that the issue will be carried to the United States Supreme Court if necessary.

#### Government to Investigate

The Department of Justice announced in Washington last Saturday that an investigation would be conducted immediately to determine whether the merger would violate the anti-trust laws. The Department of Justice made it plain that its proposed investigation did not indicate that the merger would be forbidden, and the issue hangs on whether, in the opinion of the Government's legal department, competition in the steel industry would be hindered by the formation of a company which would control upward of 20 per cent of the country's steel-making capacity. However, it was made clear that the mere matter of size is not the whole question, in view of the fact that the United States Supreme Court ruled that the United States Steel Corporation did not constitute a monopoly.

The legal questions involved in the merger controversy may not be de-

#### Regular Annual Meeting April 22

A call has been issued for the regular annual meeting of Sheet & Tube stockholders for Tuesday, April 22. By agreement, both sides will not bring the merger controversy into this meeting, which will be largely devoted to the election of a board of directors and other routine business. However, it is regarded as certain that the Eaton group will seek larger representation on the board. S. Livingston Mather, of Cleveland, who recently succeeded the late A. E. Adams on the board, is now the only Eaton group director. Although a son of Samuel Mather, who favored the Youngstown-Bethlehem merger, S. Livingston Mather announced himself as opposed to the merger when the vote of the board of directors was taken.

James A. Campbell, Newton D. Baker, his counsel, and Harold T. Clark, attorney for Cyrus S. Eaton, have been named as the proxy committee for the annual meeting.

### Steel Corporation's Orders Gain 90,905 Tons

For the seventh month in succession unfilled orders of the United States Steel Corporation registered a gain. For March the increase was 90,905 tons, which compares with an increase in February of 11,038 tons and with 51,517 tons in January. The total unfilled orders on March 31 were 4,570,653 tons. A year ago the unfilled orders were 4,410,718 tons.

Unfilled tonnage at the end of each month for the past two years follows:

	1930	1929	1928
March	4,570,653	4,410,718	4,335,206
February	4,479,748	4,144,341	4,398,189
January	4,468,710	4,109,487	4,275,947
December	.....	4,417,193	3,976,712
November	.....	4,125,345	3,673,000
October	.....	4,086,562	3,751,030
September	.....	3,902,581	3,698,368
August	.....	3,658,211	3,624,043
July	.....	4,088,177	3,570,927
June	.....	4,256,910	3,637,000
May	.....	4,304,167	3,416,822
April	.....	4,427,763	3,872,133

The total on March 31 is the largest since Feb. 28, 1926.

# Blast Furnace Rebuilt in 92 Days

## Stack of 1100 Tons Replaces One of 600 Tons in Three Months from Last Iron to First Blast

A PROBABLE record in blast furnace reconstruction has been made by the Weirton Steel Co., Weirton, W. Va., division of the National Steel Corporation, in the replacement of its old No. 1 stack, which had a daily capacity of 600 tons, with an 1100-ton furnace on the same foundation. The last cast on the old furnace was made at 5.45 a. m. on Jan. 1. The new stack was blown in at 11.45 p. m. on April 2, the total lapse of time having been 91½ days.

On the ninth day after lighting, the furnace produced 1105 tons of iron, slightly over its expected capacity. It has a hearth diameter of 25 ft. 6 in., a bosh of 29 ft., a stock line of 19 ft. 4 in. and a large bell of 14 ft. 2 in. The height from center line of iron notch to top ring is 91 ft. 6 in. The furnace is supported on 16 cast iron columns, with 16 tuyeres. Four uptake and downcomer branches join into two main downcomers connecting with the existing gas cleaning system. An entire new furnace top with McKee distributor was installed.

### Business Recession Advanced Date

Old No. 1 furnace at Weirton was blown in in July, 1919, and a second stack of 800 tons capacity daily was lighted in November, 1926. Decision to increase the capacity of the older stack was made early in 1929. It was originally planned to blow out the old furnace on April 1, 1930, but the date

was advanced three months on account of the business recession.

The old furnace was entirely dismantled by the Weirton company's own organization. The furnace top was taken down to the top ring and the bell removed in 18 hr. After cooling down, the lining was removed in 59 hr. The remainder of the shell, including columns and base plate, was taken out completely in 25 hr. It was found necessary to remove 1300 yd. of old concrete under the furnace; this was done without disturbing the adjacent concrete supporting the skip truss and A-frame.

### New Work Prosecuted Rapidly

By Feb. 3, new concrete had been poured and the base plates for the new furnace set. The hearth jacket and tuyere jacket were placed and set by Feb. 9. At this juncture a scaffold was built over the top of the tuyere jacket and brickwork was started in the bottom. The complete shell, including the dome, was in place by Feb. 25 and the lining of the furnace and of No. 3 stove was completed by March 23.

Meantime, the existing skip structure, which was supported on an A-frame independent of the old furnace, was reinforced and attachment made to the top of the new furnace. A new Lidgerwood hoist engine was installed, two Robins rotary grizzly screens with coke breeze and nut separation equip-

ment were put in, and new bins were placed in the stockhouse. Complete new iron and cinder runs were provided and extended, to accommodate the larger furnace.

Steelwork on the furnace proper and on the skip structure was fabricated and erected by the Riter-Conley division, McClintic - Marshall Co., Pittsburgh. Brickwork for the lining was in the hands of A. E. Anderson Co., New Castle, Pa. General supervision was handled by the Weirton company's engineering department.

## Iron and Steel Institute's Papers for May Meeting

For the next meeting of the Iron and Steel Institute, to be held May 1 and 2 at the quarters of the Institute of Civil Engineers, Great George Street, London, the following technical program has been arranged:

"Some Alloys for Use at High Temperatures. Nickel-Chromium and Complex Iron-Nickel-Chromium Alloys," Part I by W. Rosenhain and C. H. M. Jenkins; Part II by C. H. M. Jenkins, H. J. Tapsell, C. R. Austin and W. P. Rees.

"Developments in Fuel Economy at Skinningrove," by F. Bainbridge.

"Carburizing and Graphitizing Reactions Between Iron-Carbon Alloys, Carbon Monoxide and Carbon Dioxide," by M. L. Becker.

"An Experimental Inquiry into the Interactions of Gases and Ore in the Blast Furnace. Part II—Carbon Deposition at 450 Deg. C. and Its Influence upon the Ore Reduction; Equilibria Between Gases and Ore at 650 to 1000 Deg. C.," by W. A. Bone, L. Reeve and H. L. Saunders.

"The History of the Cementation Process of Steel Manufacture," Part I by D. Brownlie; Part II by Baron de Laveleye.

"The Metallography of Some Ancient Egyptian Implements," by H. C. H. Carpenter and J. M. Robertson.

"Alloys of Iron Research. Part IX—The Constitution of the Alloys of Iron with Silicon," by J. L. Haughton and M. L. Becker.

"Chromium-Copper Structural Steels," by J. A. Jones.

"The Corner Ghost in Steel Ingots," by S. Maita.

"Tin and Sheet Mill Rolls. Their Treatment, Performance, and Premature Failure in Service," by E. Mort.

"The Effect of Melting Conditions on the Microstructure and Mechanical Strength of Gray Cast Irons Containing Various Amounts of Carbon and Silicon," by A. L. Norbury and E. Morgan.

"The Properties of Some Steels Containing Chromium," by A. R. Page and J. H. Partridge.

"Single-Sheet or Thin-Pack Normalizing, or Heat Treatment versus Box-Annealing of Sheets," by R. Whitfield.

Additional meetings will be held at the Birmingham Chamber of Commerce, Tuesday, May 6, at which four of the papers, presented at the annual meeting, will be discussed, followed by an additional meeting at the Royal Metal Exchange, Swansea, Wales, May 13, at which three of those papers will be read.

## COMING MEETINGS

### APRIL

**American Welding Society.** April 23 to 25. Annual meeting, Engineering Societies Building, New York. M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

**Chamber of Commerce of the United States.** April 28 to May 1. Eighteenth annual meeting, Chamber of Commerce Building, Washington. D. A. Skinner, Chamber of Commerce Building, Washington, secretary.

### MAY

**American Gear Manufacturers' Association.** May 1 to 3. Fourteenth annual meeting, Hotel Gibson, Cincinnati. T. W. Owen, 3608 Euclid Avenue, Cleveland, secretary.

**Taylor Society.** May 1 and 2. Spring meeting, Deshler-Wallick Hotel, Columbus, Ohio. H. S. Person, 29 West Thirty-ninth Street, New York, managing director.

**American Iron and Steel Institute.** May 9. Thirty-seventh general meeting, Hotel Commodore, New York. E. A. S. Clarke, 75 West Street, New York, secretary.

**American Foundrymen's Association.** May 12 to 16. Convention and exposition, Public Auditorium, Cleveland. C. E. Hoyt, 222 West Adams Street, Chicago, secretary.

**National Industrial Conference Board.** May 15. Annual meeting, Hotel Astor, New York. Magnus W. Alexander, 247 Park Avenue, New York, president.

**National Hardware Association of the United States.** May 16 and 17. Annual meeting of the metal branch, Clifton House, Niagara Falls, Ontario, Canada. George A. Fernley, 505 Arch Street, Philadelphia, secretary.

**American Society of Mechanical Engineers.** May 19 to 21. Fourth annual aeronautic meeting, Dayton, Ohio. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

**American Refractories Institute.** May 19 and 20. Annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Dorothy A. Texer, 2218 Oliver Building, Pittsburgh, secretary.

**National Foreign Trade Council.** May 21 to 23. Annual meeting, Hotel Biltmore, Los Angeles. O. K. Davis, India House, New York, secretary.

**Society of Automotive Engineers.** May 26 to 29. Summer meeting, French Lick Springs Hotel, French Lick Springs, Ind. C. F. Clarkson, 29 West Thirty-ninth Street, New York, general manager.

**American Electrochemical Society.** May 29 to 31. Spring meeting, Coronado Hotel, St. Louis. Colin G. Fink, Columbia University, New York, secretary.



# Unfilled Orders Gain One Promising Item

BY LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

**S**TEEL production in March was exactly at our theoretical normal level; that is, eliminating seasonal variation, the average daily ingot output was exactly on the line of normal growth. The adjusted index is 100, which compares with 107 in February and 120.1 a year ago.

Pig iron production also showed the resumption of a declining trend in March, the adjusted index for that month being 102 per cent of normal, against 104.3 in February and 117.7 a year ago. This decrease is due to a failure of the average daily pig iron output to increase as much as usual for the season. It indicates some excess in the supply.

As to the state of the demand for steel and pig iron, we must look to orders and to price trends. We find that our composite index of the sales of finished steel in February (not shown in the chart) has shown a decline of unusual sharpness.

The unfilled orders of the Steel Corporation in March increased more than usual for the season. While the decrease in steel production during the month indicates that shipments declined, and this alone would explain a part of the gain in unfilled orders, the increase may be considered as moderately favorable and indicates that the new business of the leading steel producer was well sustained. On the 1923-1927 base, our adjusted index of unfilled orders is 101.2, against 97.6 in February and 97.7 a year ago.

As to prices, the indications bearing on demand are none too favorable. It may well be asked why,

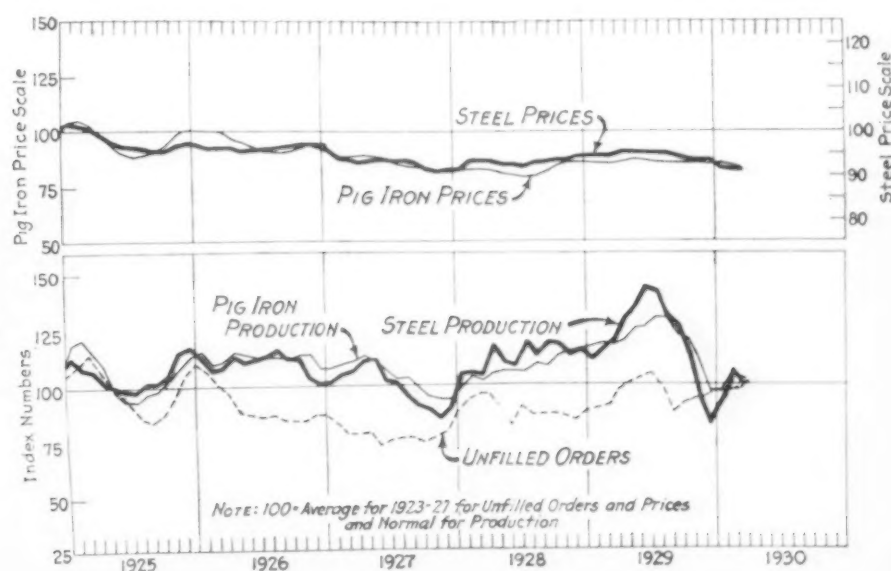
if supply is well adjusted to demand, steel prices are so weak? Why do we find so many reports of keen competition and price concessions? If the demand is such as to justify the moderately good level of production, why the sagging scrap market? If unfilled orders by their increase indicate a growing volume of new business, why was the finished steel average lower in March than in February?

THE IRON AGE composite price of finished steel in March averaged 91.2 per cent of the 1923-1927 average, and its pig iron composite for the same month was 83 per cent—both being lower than in the preceding month or than a year ago.

It almost seems that the January-February recovery in the production of iron and steel has turned out to be like that which occurred in early 1924, when further recession followed; and the doubtful character of the upturn is emphasized by the fact that it has lacked the support of such a spurt in demand and in prices as occurred in 1924. The decline in steel production last month is the only March decline that has occurred since 1921. As the author's P-V line and other tried barometers of general business continue in an unfavorable position, the indications are that some further recession in production will be required.

And if this conclusion should prove correct, continued price weakness will be almost inevitable. Further weakness in scrap is possible, and another month of March-like trends would bring cheaper pig iron.

**SHOWING of**  
March in Pro-  
duction and Prices  
Is Taken to Indicate  
That General Busi-  
ness Continues in an  
Unfavorable Position





# This Issue in Brief

If you want your galvanizing pots to last longer, keep the bath temperature under 885 deg. No part of the pot should be heated above 900 deg. Pot destruction at 850 deg. is only one-half what it is at 900 deg.—Page 1154.

Defects in die castings arise mainly from two causes: (a) Incorrect specification of the die casting procedure; (2) departure from specified procedure. The former leads to characteristic or chronic defects, the latter to occasional.—Page 1137.

You are overlooking a mine of valuable ideas, if you are not using an employees' suggestion box. Workers are not automations. Some possess undreamed of ability. Unknown to you, a machine operator by day may be a deep student of industrial management at night. He may have an idea how your costs can be cut.—Page 1144.

No chances taken in making bridge wire. Better use a three-high blooming mill. On a two-high mill the head roller is tempted to take too great a reduction per pass, thus injuring the steel, with telling effect later.—Page 1148.

Six men take the place of sixteen. New cupola-charging equipment makes big labor-saving in Nash foundry. Pig iron and coke feed by gravity into charge buckets mounted on truck cars. Charging crane dumps contents of buckets into cupola.—Page 1138.

When production lags mysteriously or when rejections mount for no good reason, the man at the machine may be able to give you the answer. An employees' suggestion system costs little to operate and usually yields valuable ideas and information. Best results are obtained when the anonymity of the suggester is preserved.—Page 1145.

Group piecework substituted for individual piecework in Nash foundry. Each group of men has a leader. A schedule is set for each group and when they complete their schedule they may leave for home. Group is paid for castings accepted in the shipping room. Earnings are higher now than before; so is production.—Page 1143.

Reduction in production costs results from standardizing hoist parts, even though the change has brought about the use in some cases of a heavier part than engineering requirements demand. By reducing the number of different sizes of parts, long machine runs, with fewer set-ups, are possible.—Page 1157.

Welded tube with thin walls has superior accuracy, Bureau of Standards finds. Welded joint proves, under test, to be as strong as the original strip.—Page 1146.

Sharp reduction in labor costs in crane manufacture results from carrying drills, riveters and other manufacturing tools on light overhead cranes which themselves have the necessary hoists for handling, turning over, etc., the material being worked upon. This permits one man to do the entire job, whereas four or five men were formerly needed.—Page 1158.

Does the stock market recovery presage a business revival? Too early to judge, says economist. Not all stock market swings are significant. Stock market is not an infallible barometer. Precedent gives no ground for assuming that the stock market will not have another sinking spell.—Page 1159.

Galvanizing pot lasts 12 years, says owner. Entirely possible, says galvanizing specialist, if bath temperature had been kept under 800 deg. Fahr.—Page 1155.

Cuts costs by drilling four thicknesses of crane members in a single operation. Two angles are spot welded along upper and lower edges of each of two cheek plates, which have been cut to shape. Then one plate is laid on top of the other and all rivet holes to connect the plates and angles are drilled through four thicknesses at once.—Page 1157.

If one of your workmen develops a valuable invention on your time, using your tools and materials, you have the right to use the invention in your plant, but nowhere else. If you move away or sell the plant, you cannot take the right to use the invention with you.—Page 1146.

Cheap money can do little to start an upturn in business. Cheap money is largely the result of slackened business activity. Federal Reserve has poured credit into the market by buying securities. Instead of a scramble for gold, there is a flight from gold. Risk of new shock to confidence, by collapse of a premature stock market boom, is greater than the prospect that cheap money will hasten the return of prosperity.—Page 1160.

To improve die casting quality, select at least three specimens cast in the same die; X-ray them. Any defects due to casting technique will be likely to appear in all pictures. By comparing pictures with the die, the causes for interior defects can be found.—Page 1137.

Oftentimes the foreman is the only "boss" the workman knows, and he cannot afford to bring on his head displeasure from his superior. Accordingly, if you want the workman's ideas, be sure that privacy is assured the suggestions he drops into the plant suggestion box. Make it possible for him to collect his reward without revealing his identity to his immediate superiors.—Page 1145.

# Technical Program for Foundrymen

## Thirty-three Papers at 14 Sessions—Three Shop Operation Courses and Round-Table Discussions

**A**N unusually high-grade technical program has been arranged for the annual convention of the American Foundrymen's Association in Cleveland May 12 to 16. A business session is scheduled for the opening on Monday, May 12, and the first shop operation course on gray iron at 4 p. m. the same day. The sessions on technical subjects begin on Tuesday, May 13, and are as follows:

### Foundry Costs

"A Recommended Standard Cost System for Gray-Iron Foundries," by J. L. Carter, Sacks-Barlow Foundries, Inc., Newark, N. J.

"Organizing a Non-ferrous Foundry Cost Group," by C. S. Humphries, Westco Chippewa Pump Co., Davenport, Iowa.

### Malleable Founding

"Continuous Melting Process as Applied to Malleable Iron," by B. R. Mayne, Saginaw Malleable Iron Division, General Motors Corporation, Saginaw, Mich.

"Factors Affecting Machinability of Malleable Cast Iron," by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.

"Some Features of the Pulverized-Coal-Fired Air Furnace," by E. F. Wilson, Jefferson Union Co., Lockport, N. Y.

### Cast Iron Metallurgy

"Effects on Cast Iron of Prolonged Heating at 800-1100 Deg. Fahr.," by R. S. MacPherran and R. H. Krueger, Allis-Chalmers Mfg. Co., Milwaukee.

"Blistering Tendency of Some Cast Iron When Enameled," by A. I. Krynlitsky and W. H. Harrison, Bureau of Standards, Washington.

### Non-ferrous Foundry Practice

"Deep-Etch Test of Brass," by W. F. Graham and L. A. Meisse, Ohio Brass Co., Mansfield, Ohio.

"Application of Ingot Metal to Production of Brass and Bronze," by William Romanoff and C. O. Thleme, H. Kramer & Co., Chicago.

"Overcoming Alloy-Ingot Troubles in the Brass Foundry," by William S. Paulson, Thomas Paulson & Son, Brooklyn.

### Gray Iron Foundry Practice

"Briquetting Cast Iron Borings," by H. Rayner, Dodge Brothers Corporation Division, Chrysler Corporation, Detroit.

"Continuous Melting from Cold Stock of Gray Iron in Electric Furnace," by N. L. Turner, Beach Foundry, Ltd., Ottawa, Canada.

"Methods for Determining the Volume Changes Undergone by Metals During Casting," by E. J. Ash, A. F. A. Research Associate, United States Bureau of Standards, Washington.

### Non-ferrous Founding

"Care and Maintenance of Fuel-Fired Furnace Linings in the Non-ferrous Foundry" and "Selection and Use of Refractory-Maintenance Cement in the Non-ferrous Foundry," by H. E. White, Lava Crucible Co., Pittsburgh.

"Stronger Aluminum Castings by Improved Foundry Practice," by E. M. Gingerich and H. J. Rowe, Aluminum Co. of America, Pittsburgh.

"Progress in Die-Casting Industry," by Marc Stern, A. C. Spark Plug Co., Flint, Mich.

### Sand Control

"Sand Control as Viewed from the Producers' Standpoint," by W. W. Kerlin, Enterprise Sand Co., Pittsburgh.

### Management

"The Value of Sales Analysis and Market Research," by J. P. Newman, McGraw-Hill Publishing Co., New York.

"The Value of Cleanliness and Neatness in a Foundry," by Edward Trapken, Sandusky, Ohio.

"Personnel Management," by Harry Meyer, Frigidaire Corporation, Dayton, Ohio.

### Steel Founding

"Reclaiming Steel Foundry Sands," by M. D. Pugh, Illinois Testing Laboratories, Inc., Chicago.

Address by George Batty, Steel Castings Development Bureau, Philadelphia.

"Australian Steel Foundry Practice," by D. Clark, Adelaide, Australia. (Submitted on behalf of the Bureau of Steel Manufacturers of Australia.)

### Apprentice Training

"Foundry Apprentice to Apprentice Foreman," by E. H. Ballard, General Electric Co., West Lynn, Mass.

"Where Are the Young Foundrymen?" by S. W. Utley, Detroit Steel Casting Co., Detroit.

### Gray Iron Metallurgy

"Carbon and Sulphur in the Cupola—Some Properties of Coke," by James T.

MacKenzie, American Cast Iron Pipe Co., Birmingham.

"Correlation of Tests for Cast Iron," by J. G. Pearce, director, British Cast Iron Research Association, Birmingham, England. (Presented as the Annual Exchange Paper of the Institute of British Foundrymen.)

### Materials Handling

"Continuous Core Ovens," by D. B. Hill, Palmer-Bee Co., Detroit.

"Materials Handling," by W. M. Booth, Syracuse, N. Y.

"Reducing Materials Handling Costs in the Jobbing Foundry," by F. C. Campbell, Eastern Corporation, New York.

### Melting Furnaces and Core Practice

"Induction Furnaces for Ferrous and Non-ferrous Metals," by Manuel Tama, Berlin, Germany.

"Value of Analyses and Specifications for Core Oil," by J. A. Gitzen, Lindsay-McMillan Co., Milwaukee.

"A Study of Non-ferrous Crucible Melting," by H. E. White, Lava Crucible Co., Pittsburgh.

Three round-table discussions have been scheduled, one on malleable iron founding on Tuesday noon, May 13, with P. C. DeBruyne, Moline Malleable Iron Co., St. Charles, Ill., as chairman. The other two are scheduled for noon of Thursday, May 15, one being devoted to steel founding with W. J. Corbett, Fort Pitt Steel Casting Co., McKeesport, Pa., as chairman, and the other to non-ferrous founding, with H. M. St. John, Detroit Lubricator Co., Detroit, the chairman. At 4 p. m. on Tuesday, Wednesday and Thursday simultaneous shop operation courses have been arranged in gray iron founding, in steel founding, and non-ferrous founding.

## Licensing of Engineers Is Subject of Lecture

Licensing and registration of professional engineers are to be discussed at a meeting of the New York section of the American Institute of Mining and Metallurgical Engineers, Wednesday evening, April 23, at the Building Trades Employers' Association, 2 Park Avenue, New York. The speakers will be Arthur V. Sheridan and V. T. Boughton. An informal dinner at 6:30 p. m. will precede the meeting.

## Foundry Associations to Hear J. G. Pearce

Special arrangements have been made whereby J. G. Pearce, director of the British Cast Iron Research Association, Birmingham, England, will address a number of district foundry associations in this country on the occasion of his American visit the latter part of April and in May. Mr. Pearce, who is making this trip chiefly to present the annual exchange paper of the Institute of British Foundrymen before the Cleveland convention of the American Foundrymen's Association, is internation-

ally known for his metallurgical research work, particularly in the field of cast iron.

The schedule of meetings at which Mr. Pearce will speak, as arranged at this time, is as follows:

April 29—New England Foundrymen's Association.

May 2—Detroit Foundrymen's Association.

May 5—Quad City Foundrymen's Association.

May 6—Chicago Foundrymen's Club.

May 7—Wisconsin Gray Iron Foundry Group.

May 8—St. Louis District Foundrymen's Club.

May 27—Philadelphia Foundrymen's Association.

May 28—Newark Foundrymen's Association.

## Rail Steel Bar Makers to Meet

The Rail Steel Bar Association will hold its regular semi-annual meeting May 9 at the Commodore Hotel, New York. Organized in 1912, it includes in its membership the larger rail steel mills of the United States and Canada, and has for some years held its business meetings in conjunction with the sessions of the American Iron and Steel Institute.



## Milwaukee Plant Taking Steel Shipments by Boat

Practically all of the plates required by the A. O. Smith Corporation, Milwaukee, for its automobile frame division, will henceforth be shipped from Gary, Ind., to Milwaukee, by lake steamer, following successful experiments conducted late in the 1929 season of navigation. The first cargo, consisting of 2500 tons, arrived in Milwaukee on April 10 on the steamer Burlington. The cargo was unloaded at the Reed Street docks and forwarded to the Smith plant by rail.

According to George B. Hetherington, traffic manager of the Smith company, most of the plates required for the welded pipe division will continue to be brought to Milwaukee by rail, although at times the water route will be used. Navigation between Gary and Milwaukee is open all the year. The Burlington is capable of carrying 2800 tons and making two trips to Milwaukee each week.

## British Empire Steel to Be Reorganized

A reorganization of the British Empire Steel Corporation of Canada as the Dominion Steel & Coal Corporation has been proposed, and directors of this company and the Dominion Steel Corporation, Ltd., and the Dominion Iron & Steel Co., Ltd., have approved the sale of the three companies to the new corporation that will be formed to take them over. A letter to this effect has gone out to stockholders. The British Empire Steel Corporation was organized in 1920 to merge Canadian steel companies. It offered a reorganization plan in 1927, but this was rejected by shareholders.

## Presents "Electrolene" as a Hydrogen Substitute

Claimed as an inexpensive substitute for industrial hydrogen, an industrial gas called Electrolene has been developed by the General Electric Co., Schenectady, N. Y. It is described as better than hydrogen in many applications and as being produced by feeding steam and city gas, or other hydrocarbons, into an electric cracking device developed by the company.

This gas can be made at about one-tenth of the cost of hydrogen and is expected to be of especial value when used in electric furnaces with controllable atmospheres, in heat-treating processes, in brazing, etc., as well as in metal cutting and other industrial applications. A typical installation for producing 1500 cu. ft. per hr. is described as built in the form of a cylindrical shell 7 ft. in diameter and about 10 ft. high.

The principal advantage in using the new gas is said to be the low cost involved in its manufacture and with

maintenance of the equipment. An installation now in use at the Schenectady plant of the General Electric Co. has a capacity of 1000 cu. ft. an hour and produces gas for less than \$1 per 1000 cu. ft. overall.

One of the first practical applications of the new gas producer is to the process of brazing in a hydrogen atmosphere. The General Electric Co. announces that it now has on the market an equipment for producing gaseous atmospheres in place of the hydrogen used for such brazing purposes. Chemically, Electrolene is composed largely of hydrogen and carbon-monoxide. Small percentages of methane and nitrogen are also present, but carbon dioxide, illuminants, and oxygen, usually present in city gas, are absent in the cracked product. It is stated that the characteristics of the cracked gas can be varied somewhat in actual manufacture.

## To Make Two Awards for Artistic Bridges

A jury of nationally known architects and engineers has been selected by the American Institute of Steel Construction to decide upon the most artistic bridges built of steel during the past year. This will be the second annual award. In the first, the Sixth Street Bridge in Pittsburgh was judged the most beautiful bridge opened to traffic during 1928.

It is the intention of the institute to make two awards this year, one for the steel bridge costing more than \$200,000 and another for the steel bridge costing less than that amount. These will constitute the most beautiful long-span and the most beautiful short-span bridges opened to traffic during 1929. Decisions will be based on photographs now being submitted and awards will be determined at a meeting of the jury of award in June.

The jury consists of two engineers, two architects and a fifth to represent civic interests. They are Stephen F. Voorhees, architect; Gustav Lindenthal, bridge engineer; Prof. William H. Burr, consulting engineer; Cass Gilbert, architect; and Dr. Horace McFarland, president of the Pennsylvania Fine Arts Commission.

## Decline in Factory Wages in February

Average weekly earnings in representative New York State factories in February are reported by the State Industrial Commissioner to have been \$29.46, a drop of 34c. from the \$29.80 average for January. The February figure also reflects a decline of almost 2 per cent from the \$29.99 average for February, 1929, and is the lowest monthly average since August, 1928—just 18 months. It is, however, higher than that for any preceding February, with the exception of last year.

## Western Railroad Traffic Is Increasing

Many Western railroads handled practically the same number of cars during the first seven days of April this year as in the same period of 1929. The Chicago, Rock Island & Pacific exceeded last year's record by handling 34,238 cars, as compared with 33,641 cars in the first week of April last year. The Wabash was another road to exceed last year's traffic, with 20,122 cars, as compared with 19,535 cars.

## Record Consumption of Coking Coal

Total estimated consumption of coking coal in by-product plants in 1929, a record year, was 77,178,178 net tons, according to the Bureau of Mines. This is an increase of 10 per cent over the 70,165,906 tons consumed in 1928.

The 23 plants in the Middle Atlantic region reporting to the bureau consumed 31,187,329 tons of coal in 1929, an increase of 2,471,846 tons, or 8.6 per cent over the 28,715,483 tons consumed in 1928. The 15 reporting Illinois-Indiana plants consumed 14,634,328 tons, an increase of 1,719,096 tons, or 13.3 per cent. The 15 reporting Ohio plants consumed 12,303,918 tons, an increase of 837,874 tons, or 7.3 per cent. The 13 reporting plants in the Southeast consumed 9,713,749 tons, an increase of 756,364 tons, or 8.4 per cent.

Five reporting New England plants showed the great increase of 38.3 per cent. They consumed 1,920,308 tons, or 531,928 tons more than in 1928. The only decrease was reported by the three Mountain and Pacific plants, which consumed 1,348,863 tons, a decline of 55,260 tons, or 3.9 per cent.

## Dupont Buys Chemical Company

E. I. duPont de Nemours & Co., Wilmington, Del., has acquired Roessler & Hasslacher Chemical Co., 10 East Fortieth Street, New York, manufacturer of industrial chemicals, with main plants at Perth Amboy, N. J., and Niagara Falls, N. Y., and its affiliated organization, R. & H. Platinum Works, Inc., manufacturer of platinum metals, etc. The purchasing company will organize a new corporation to take over the properties and will continue operations under the Roessler & Hasslacher name. Consolidation of manufacture of different specialties, now made by both companies, will be carried out.

Total apparent consumption of bab-bitt metal in February was 3,726,576 lb., compared with 4,408,455 lb. in the preceding month and 5,720,243 lb. in February, 1929, according to reports received by the Department of Commerce.



# Why Government Needs the Engineer

His Great Contributions to Human Well-Being, Says President Hoover, Have Multiplied Problems of Public Relationships

PRESIDENT Herbert Hoover of the United States was awarded the Hoover gold medal at a formal banquet which brought to a close on April 8 a four-day celebration of the fiftieth anniversary of the founding of the American Society of Mechanical Engineers. In accepting the medal President Hoover made a response that promises to stand out in the days to come as a statement of world-wide application of the essentiality in government today of the engineer. The main parts of that speech of acceptance, quoted in the subjoined report, bear testimony to the importance of his pronouncement.

The anniversary dinner brought to a close a series of impressive meetings held on Monday and Tuesday, April 7 and 8, at Washington. Besides the medal presentation, the dinner was featured by an address by Dr. Robert A. Millikan, California Institute of Technology, Pasadena, on the bonds between science and engineering.

The anniversary celebration began in New York on April 5 with the unveiling of a commemorative bronze tablet in the Engineering Societies Building, and was followed in the building of the McGraw-Hill Publishing Co. by a program commemorating the preliminary meeting of the society on Feb. 20, 1880, in the offices of the *American Machinist*. In the afternoon of April 5, in the auditorium of Stevens Institute of Technology, Hoboken, N. J., where the organization meeting of the society was held on April 7, 1880, was staged a pageant depicting crises in the careers of men whose inventions and discoveries have resulted in the present machine age.

The Washington meetings, with their formalities of the receipt of credentials from associations here and abroad, and the bestowal of medals—sessions distinctly impressive and interesting—were described briefly in last week's issue in an account telegraphed from Washington.

The medal presentation was preceded by the address by Dr. Millikan and a message received from Charles Piez, president of the society, who was detained in Florida on account of illness. Dr. William F. Durand, past-president of the society, was toastmaster.

For the section of the ceremonies devoted to the bestowal of the medal, Dean Dexter S. Kimball, president of the board of award, presided. Ambrose

## President Hoover Paraphrased

THE discoveries and inventions of the engineer have brought blessings to humanity but multiplied the problems of government.

Our great national tools, developed by the engineer—of power, transportation, communication—have given rise to a multitude of problems of public relationships.

Government needs engineering knowledge and method for the solutions.

Greatest difficulties arise when emotion comes first and facts are lost in a sea of embittered controversies.

Swasey and John R. Freeman were appointed marshals to escort President Hoover to the rostrum. J. V. W. Reynders, past-president of the American Institute of Mining and Metallurgical Engineers, made the formal introduction of the President.

## Must See National Tools Are Not Misused

President Hoover expressed pleasure in joining in the anniversary celebration of the society, which "during its span of life has contributed a great part in the development of an art into a mighty profession upon whose capacity and fidelity so much of human progress must rest." The medal he described as marking the public service of men who have gone outside their strictly professional work to interest themselves in civic and humanitarian affairs, and "the engineers," he added, "have something to contribute to public service."

"With the application of science to the development of our great national tools—our engines, our railroads, our automobiles, our airplanes, our steamships, and our electric power, and a score of other great implements, together with the supplies of materials

upon which they depend—the engineer has added vastly to the problems of government, for government must see that the control of these tools and these materials is not misused to limit liberty and freedom, and that they advance and do not retard equality of opportunity among the whole of our citizens.

"These great discoveries and inventions have brought great blessings to humanity, but they have multiplied the problems of government, and the perplexity of these problems progresses constantly with the increase of our population. Every county government, every municipal government, every state government and the federal government itself, is engaged in constant attempt to solve a multitude of public relationships to these tools, which the engineers by their genius and their industry constantly force on to the very doorstep of the government.

"And in solving these problems we have need for a large leavening of engineering knowledge and of the engineering attitude of mind and the engineering method. These problems of public relations are unsolvable without the technical assistance of the engineer himself. They are unsolvable without the fundamental engineer's approach to the truth. That is, first to determine the fact, arrange these facts in proper perspective, and then to distill the truth from them in the retort of experience.

"Engineers do not undertake to build bridges, power plants, or railroads without knowing the service that they are to perform, without infinite patience in discovery of economic and scientific fact, without an adaptation of experience, without giving consideration to the capacity of the human material available to conduct them, and without the final crystallization into positive and constructive action.

No one emotion enters into these determinations. Emotion is permissible only in contemplation of their service to humanity. But when the problems which these great tools create come to the door of the government, they are at once emotional problems. If we would deal with them constructively, we must traverse the same hard road in determining the service we wish to perform, and with the same infinite patience discover the economic and scientific facts, with the same care and regard for

adaptation of experience, with the high regard for the human material available to conduct our administration, and with the same positive action in their application.

"Our greatest difficulty is dealing with these problems of government when emotion comes first. The facts and technical knowledge come but slowly and are often lost in a sea of embittered controversy.

#### Engineers Can Do Much

"It is for all these reasons that the engineers with their training, with their attitude of mind, and their method, can contribute to the solution of the problems which arise from their own creation.

"I am not advocating that all public service be turned over to engineers. I have a high appreciation of the contribution of the other professions, but the engineers I do insist have a contribution to make to public service and they have obligations to give that contribution, and this distinction which has been established by the United Engineering Societies should mark this necessity and should stimulate activities of our engineers in such service."

The Hoover Gold Medal was instituted to commemorate the civic and humanitarian achievements of Herbert Hoover and to him the first award was made. From time to time the medal will be awarded by engineers to a fellow engineer for distinguished public service.

The trust fund creating the award is the gift of Conrad N. Lauer, of Philadelphia. It is held by the American Society of Mechanical Engineers and is administered by a board of award consisting of representatives of the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers.

#### Broad Responsibilities of the Engineer

Mr. Reynnders, in his address, paid a number of graceful tributes to President Hoover and the American Society of Mechanical Engineers, and devoted himself to the "great unanswerable questions of the future," the solution of which "must be the preoccupation of patriotic leadership in the years to come." "Certain it is," said he, "that the problems of size, of humanity super-energized with mechanical power, social impulses that are magnified in effect by instant means of communication, will call into action all of the intelligence and all of the restraint of which we as a nation are capable."

He regarded the problems as not solely confined to subjects of national import. "On the contrary," he said, "the contentment of the people, by which the success or failure of our institutions must be gaged, is dependent in great measure upon the conditions which surround the individual in his home community—healthfulness, op-

portunities for intellectual advancement, sound conditions of employment, and a general atmosphere of progress.

"No one profession or calling," he continued, "nor any particular section of the people, has a call to service beyond any other, but there can be no doubt of the duty and of the ability of the engineering profession to take a large and increasing part in the development of a social system which in scale and dynamic qualities is without precedent.

"Conspicuous among the builders of this great superstructure we confidently look forward to a roster of distinguished medalists who will have become a heritage of this great calling and whose names may appropriately be classed with the one whose unselfish record of service and accomplishment will continue for all time to be an inspiration to his colleagues and to every good American, Herbert Hoover."

#### Soviet Buying More in United States

Trade of the U. S. S. R. with the United States during the first half of the current fiscal year, beginning Oct. 1, 1929, reached the record total of \$98,000,000, compared with \$61,000,000 in the six months ended March 31, 1929, a gain of 61 per cent, according to the Amtorg Trading Corporation, New York.

Orders placed by this company and by the All-Russian Textile Syndicate, Inc., Centrosoyus-America, Inc., and Selskosojus-America, Inc., aggregated \$77,159,000 for the half-year, compared with \$46,881,000 in the corresponding period of the preceding fiscal year.

Purchases of American industrial, agricultural and automotive equipment and supplies for the six months totaled \$56,700,000, nearly four times the purchases in the corresponding half-year of 1928-1929. In particular, orders for industrial and transportation equipment, totaling \$24,800,000, increased 2½ times, while purchases of agricultural equipment, valued at \$24,700,000, increased more than six times.

#### Dr. Jeffries to Address New York Steel Treaters

"The Metallurgist in the Steel Industry" will be the subject of an address by Dr. Zay Jeffries, consulting metallurgist, Aluminum Co. of America, Cleveland, and past-president of the American Society for Steel Treating, at the April meeting of the New York chapter of the society Thursday evening, April 24. The meeting will be held in the assembly room of the Merchants' Association of New York in the Woolworth Building at 8 p. m. It will be preceded by an informal

Dr. Millikan subscribed also for the increasingly important place to be taken by those of scientific or engineering training. In the course of his address, he said:

"Some understanding of the basis of our civilization, and this is certainly scientific, is needed to enable man to act intelligently in it. There is no education that can compare with the scientific one in thoroughness and analytical rigor, and none which teaches so well the objective method, the world's most supreme need for the solution of all its problems.

"When a thousand years hence the oil and coal are gone, it will be the scientist and the engineer who will capture with a solar engine of some kind the sun's fire and do man's work with it. We need not fear the exhaustion of our stored supply, for two modern countries receive in a day as much heat as is produced by all the coal burned in 24 hr. throughout the world."

dinner at 6:30 in the Postkellar restaurant in the basement of the building.

At the May meeting of the chapter, Monday evening, May 12, Owen K. Parmiter, metallurgist, Firth-Sterling Steel Co., McKeesport, Pa., will give a lecture on "Cemented Tungsten-Carbide." He promises to discuss some recent developments.

#### Cast Iron Pipe Producer Expects Better Business

United States Pipe & Foundry Co. report for 1929 shows net profits of \$2,581,229, compared with \$1,812,227 for 1928. Dividends of \$2 a share on 60,000 shares of common stock and \$1.20 a share on 780,000 shares of preferred stock were declared during the year. In commenting on probable conditions during 1930 the report says:

"It would seem that business for 1930 should show an increase in tonnage over 1929 and 1928, in that funds are apparently now available for municipal water works financing which have not been available, due to conditions in the money market, over the last two years.

"During the year two important decisions have been handed down by the Interstate Commerce Commission affecting the freight rates on cast iron pipe from various producing centers. If the tariffs made necessary by these decisions go into effect, they will considerably change the production at various plants.

"Large importations of pipe, mainly from France, continued to affect the tonnages booked during the year. It is estimated that in portions of the country where the greatest volume of imports are sold, such imports represent better than 20 per cent of the business booked."



## Metal Schedule Rates in Hawley-Smoot Bill

	Rates Adopted by Conference	Senate Bill Rates	House Bill Rates	Present Rates
Pig iron, ton.....	\$1.125	75c.	\$1.125	\$1.125
Manganese ore, lb.....	1c., containing over 10 per cent manga- nese	1c., containing over 10 per cent manga- nese	1c., containing over 30 per cent manga- nese	1c., containing over 30 per cent manga- nese
Fluorspar, metallurgical, ton.....	\$8.40, less than 97 per cent calcium fluo- ride	\$8.40, less than 93 per cent calcium fluo- ride	\$8.40	\$8.40
Graphite, amorphous, per cent.....	10	10	10	10
Sponge iron, ton.....	\$2.25	75c.	\$6.72	30 per cent (\$9 ton)
Hammer scale, ton.....	75c.	75c.	75c.	75c.
Ferrochrome, 3 per cent or more carbon, lb..	2.5c.	2.5c.	3.5c.	3.5c.
Ferrochrome, less than 3 per cent carbon, per cent.....	30	25	30	30
Tungsten metal and carbide, lb., and per cent	60c. and 50	60c. and 50	60c. and 25	60c. and 25
Silicon aluminum, aluminum chief value....	5c. lb.	2c. lb.	5c. lb.	5c. lb.
Ferrosilicon-aluminum, aluminum chief value	5c. lb.	2c. lb.	5c. lb.	25 per cent
Silicon aluminum, chief value not aluminum.	5c. lb.	3.5c. lb.	5c. lb.	Free
Ferrosilicon-aluminum, chief value not aluminum	5c. lb.	25 per cent	5c. lb.	25 per cent
Materials in para. 301 and chromium steel or iron in para. 305.....	3c. lb. on chro- mium content in excess 0.2 per cent	3c. lb. on chro- mium content in excess 0.2 per cent	4c. lb. on chro- mium content in excess 0.2 per cent	No additional cumulative specific duty for chromium content
Cerium metal, lb.....	\$2	\$1	\$2	\$2
Ferrocium, lb. and per cent.....	\$2 and 25	\$1 and 25	\$2 and 25	\$2 and 25
Hollow drill steel, lb.....	2.45c.	1.7c.	3c.	1.7c.
Wire rods, valued at over 4c. lb.....	0.6c. lb.	0.6c. lb.	20 per cent	0.6c. lb.
Wire rope, per cent.....	35	35	40	35
Tungsten or molybdenum wire, per cent.....	50	60	25	25
Ingots, shot of tungsten.....	50 per cent	60 per cent	60c. lb. tungsten content and 25 per cent	60c. lb. tungsten content and 25 per cent
Ingots, shot of molybdenum.....	50 per cent	60 per cent	50c. lb. molyb- denum content and 15 per cent	50c. lb. molyb- denum content and 15 per cent
Other forms of tungsten or molybdenum, per cent.....	50	50	50	40
Reaction chambers, per cent.....	35	25	40	25, 30 or 40
Cast iron pipe, per cent.....	25	25	30	20
Molders metal patterns, per cent.....	50	50	50	40
Printing machinery, except for textiles; book- binding, paperbox machinery, per cent..	25	25	30	30
Machines for knitting full-fashioned hosiery, per cent.....	40	40	45	40
Other textile machinery, n. s. s. f., per cent..	40	35	40	35
Punches, shears and bar cutters, per cent...	40	30	40	30
Steam turbines, per cent.....	20	15	30	15
Tools:				
Alloyed, per cent.....	60	60	60	60
Other, for cutting metal, per cent....	50	50	50	40
Hand, not for cutting metal, per cent.	45	40	50	40
Machine tools, per cent.....	30	30	30	30
Automobiles, except trucks, per cent.....	10	10	25, with coun- tervailing duty	25 with coun- tervailing duty
Trucks, buses and motorcycles, per cent.....	25	25	do.	do.
Iron and steel basket clause, per cent.....	45	40	50	40
Aluminum, scrap and alloys, lb.....	3.5c.	2c.	5c.	5c.
Aluminum sheets, bars, plates, lb.....	7c.	3.5c.	9c.	9c.
Zinc in ore:				
Under 10 per cent.....	1.5c. lb.	1.5c. lb.	Free	Free
10 to 20 per cent.....	1.5c. lb.	1.5c. lb.	0.5c. lb.	0.5c. lb.
20 to 25 per cent.....	1.5c.	1.5c.	1c. lb.	1c. lb.

### German Foreign Machinery Sales Smaller

HAMBURG, GERMANY, April 1.—The outlook is for a slight decline in machinery exports in the current year. Reports of agents in foreign markets generally agree that, except for certain types of equipment, shipments abroad will be smaller than in 1929. Markets from which a fair volume of business is expected include Cuba, South China, South Africa, Colombia, Chile and India. Demand from Argentina, Brazil, Japan, Australia, North China, Central American countries and the Near East is light, with no prospects for early revival.

Exports of German machinery reached a new high level in February, totaling 63,097 tons, which was 595 tons more than in the preceding month and 11,240 tons more than in

February, 1929. The total value of the February exports, including electrical machinery but excluding motor vehicles, was 164,871,000 m. (\$39,-404,000).

### Hanna Furnace Co. Moving Offices to Detroit

Offices of the Hanna Furnace Co., the merchant pig iron division of the National Steel Corporation, are being moved this week from Cleveland to Detroit, where they will be located at 2524 Union Trust Building. The Detroit sales office will be moved from the Buhl Building to the same headquarters. Cleveland officers of the Hanna Furnace Co., who are moving to Detroit, are C. A. Collins, president; R. E. McMahon, vice-president; W. G. Sharp, vice-president, and M. E. Arden, secretary and treasurer.

### Larger Ore Balance Than Last Year

Lake Superior iron ore at Lake Erie ports April 1, shows a dock balance of 5,092,264 tons, which is 20 per cent more than the 4,223,348 tons reported a year ago. It is, however, about 9 per cent under the 5,568,098 tons of April 1, 1928, from figures of the Lake Superior Iron Ore Association.

Receipts for the season are given as 45,772,572 tons, of which about one-quarter went to Cleveland, large amounts to Conneaut and Ashtabula and smaller quantities to Buffalo and the other ports. Shipments, which do not include movements to Lake-front furnaces, are given as 34,328,565 tons. Each of these figures is about 24 per cent higher than for the preceding year.



## A. S. M. E. Shop Practice Group Meetings

The machine shop practice division of the American Society of Mechanical Engineers is planning symposiums on a number of subjects, including economical practice in the use of cutting oils. Other topics are: High test cast iron, its physical properties and machine shop problems; nitriding of steel, experiences in processing and in usage; phenol plastic materials, economic substitution for other materials; and use of the photoelectric cell and other instruments for extremely fine measurements.

Anyone desiring to contribute to any of these symposiums is requested to communicate with Carlos de Zafra, secretary of the machine shop division of the A. S. M. E., 29 West Thirty-ninth Street, New York.

## Data on Marketing and Use of Nickel

Nickel each year is being consumed in larger quantities by the industrial nations. Present world consumption approximates 40,000 tons, of which the United States accounts for around 40 per cent.

The Department of Commerce has just issued in bulletin form the results of a study of nickel—production, consumption and marketing—recently completed in the minerals division. The purpose of this bulletin, "The Marketing of Nickel," by J. M. Furness, chief, Minerals Division, is to present in brief form answers to the questions, "What is nickel?" "Where is it produced?" "For what is it used?" and "How is it marketed?"

## How Is Seamless Tubing Drawn?

Under the title, "How Is Seamless Tubing Drawn?" a four-page pamphlet has been issued by the Summerhill Tubing Co. describing the process. An illustration shows a small-scale draw bench for this purpose which

will be exhibited at the Aircraft Show in Detroit. This miniature bench is being used for demonstration purposes. Small seamless tubes are drawn through a die and over a mandrel, just as it is done on a production basis in the company's mills at Bridgeport, Pa.

In the pamphlet the whole process is briefly described, from the making of the steel to the drawing of the tube, usually with annealing between successive draws.

## Books That Are Valuable to Steel Treaters

A small booklet of 15 pages, entitled "Steel Treating," gives a list of books of interest to members of the American Society for Steel Treating and is published by the Public Library, Washington Street, Newark, N. J. It covers alloy steels, analytical chemistry, cast iron and cast steel, electric melting, heat treatment and forgings, furnaces and fuels, metallography and metallurgy, welding, etc. There is also one page giving a list of magazines of interest to members of the society.

## To Discuss Motion Study

Application of micro-motion study to the manufacture of small parts will be outlined by R. M. Blakelock, General Electric Co., Schenectady, N. Y., at a meeting of the Metropolitan section of the American Society of Mechanical Engineers, to be held Thursday evening, April 17. Both the meeting and the dinner that will precede it will be at the Fraternity Club Building, 22 East Thirty-eight Street, New York. Dr. Lillian M. Gilbreth, president, Gilbreth, Inc., Montclair, N. J., will preside.

Mr. Blakelock will describe the use of micro-motion studies at the General Electric plant in lowering the cost of manufacturing small parts. It will be shown that it is not necessary to make complete detailed studies in order to set job standard and to fix rates. The paper will be illustrated by motion pictures.

## Woodworking Machinery Association Elects

The National Association of Manufacturers of Woodworking Machinery, meeting in Hotel Jefferson, St. Louis, April 10 and 11, elected officers as follows: President, J. William Stair, president, B. M. Rost Co., York, Pa.; vice-president, A. W. Brown, president of the Hall & Brown Woodworking Machine Co., St. Louis; secretary, A. M. Mattison, president of the Mattison Machine Works Co., Rockford, Ill., and treasurer, G. M. Diehl, president of the G. M. Diehl Machine Works, Wabash, Ind. Thirty persons were present at the convention.

## Tests Corrosion Resistance of Materials for Ranges

The Bureau of Standards has designed apparatus by the use of which samples of sheet metal can be subjected automatically to a continuous cycle of alternate heating in a gas-fired oven, and exposure to condensed moisture. These conditions are intended to reproduce the causes of corrosion in the ovens of gas ranges. Very rapid corrosion develops in the case of many of the materials tested. Results are consistent among themselves and in accord with general experience. The comparison of the various materials will be reported upon at a later date, the bureau announces.

## Illustrates Recent Foundry Installations

A new book, illustrating and describing recent installations of Link-Belt foundry equipment for the preparation and handling of sand, molds and castings, will be distributed from Link-Belt's booths No. 256 and 258, at the American Foundrymen's Convention, Cleveland, May 12 to 16. This book, No. 1090, covers recent practice. Other recently issued books of interest to foundrymen are: No. 1120, Link-Belt vibrating screen; No. 1118, describing the Saginaw Malleable Foundry, and No. 1119, covering the American Manganese Steel Co. foundries.

## Analyses of Iron Ores

Two booklets on analyses of iron ores have recently appeared. One is the usually attractive illustrated issue of Clement K. Quinn & Co., Alworth Building, Duluth, Minn., which gives the 1930 analyses for Lake Superior iron ores. The other is an equally attractive booklet of the M. A. Hanna Co., Cleveland, Ohio, giving cargo analyses of Lake Superior iron ores for the season of 1929.

Great Lakes Steel Corporation has started construction of a group of six 150-ton open-hearth furnaces at its new plant at Detroit.

## Railroad Equipment, Building Construction and Portland Cement

	March, 1930	February, 1930	March, 1929
Railroad locomotives shipped(a).....	68	67	.....
do. unfilled orders, end of month.....	535	533	.....
Trackwork produced(b), net tons.....	13,096(c)	12,524	14,927
do. first three months.....	37,450	.....	37,451
Construction volume(d).....	131	114	116
Building contracts(e), thousands.....	\$459,119(c)	\$317,000	\$483,000
Portland cement(f), thousand bbl.:			
Production.....	11,225	8,162	9,969
do. three months.....	27,885	.....	28,372
Shipments.....	8,846	7,012	10,113
do. three months.....	20,813	.....	21,268

(a) United States Department of Commerce.

(b) American Iron and Steel Institute.

(c) Largest month's total since last August.

(d) Associated General Contractors of America; index based on 100 for 1913 monthly average.

(e) F. W. Dodge Corporation.

(f) United States Bureau of Mines.

# PERSONALS

WILLIAM T. KYLE, general sales manager of the Page Steel & Wire Co., has resigned his position, effective May 1, to become president of the Welding Engineering & Research Corporation, New York. The company is to specialize in scientific and practical development of the welding industry from all angles.

CHARLES P. BURGESS, vice-president and sales manager of the Atlas Crucible Steel Co. before its merger with the Ludlum Steel Co., and since the merger active in coordinating the Ludlum-Atlas sales activities, has resigned to become an officer and director of the Radiator Shares Corporation and of the Dunkirk Radiator Corporation, Dunkirk, N. Y. He was one of the founders of the Atlas Steel Works and during the war was vice-president and production manager.

R. C. BIRD is now associated with the Chicago Steel Foundry Co., Chicago, in the capacity of sales engineer. He was with the Chain-Belt Co. for four and a half years and for the past two years with D. O. James Co.

A. W. DANIELS, since 1923 general sales manager of the American Manganese Steel Co., Chicago, has been elected vice-president in charge of sales. For seven years prior to entering the employ of the company as assistant to the industrial engineer at the Chicago Heights plant, he traveled extensively as a commercial representative. In 1920 Mr. Daniels became manager of the Chicago office and two years later was made central sales manager. The following year he was appointed general sales manager.



A. W. Daniels



T. M. Rees

T. M. REES, since 1928 vice-president of the Arch Machinery Co., Pittsburgh, has been appointed manager of the Pittsburgh district in charge of sales of Putnam machine tools and Shaw electric cranes for Manning, Maxwell & Moore, Inc., New York. In this capacity Mr. Rees will assist the company's Pittsburgh representative, the Arch Machinery Co. He has been active in that territory for the past 17 years. For 10 years of this period he was associated with Motch & Merryweather Machinery Co. and for two years was Pittsburgh district manager for the Treadwell Engineering Co. In 1925 he became connected with Manning, Maxwell & Moore, Inc., in the same district, and remained with the company until 1928, when the Arch Machinery Co. was founded.

RICHARD E. PRITCHARD, vice-president, the Stanley Works, Inc., New Britain, Conn., has been made president of the Welfare Association of the company's plant.

GERARD SWOPE, president, the General Electric Co., was the guest of the Boston Chamber of Commerce on April 10 at a luncheon. Mr. Swope expressed much confidence in the general business outlook.

J. D. STOUT, who has been associated with the Terry Steam Turbine Co., Hartford, Conn., since 1909, for the past several years as manager of the New York office, has been elected vice-president of the company and will make his headquarters in Hartford.

FRANK K. METZGER, formerly vice-president in charge of sales of the

Standard Steel Works Co., Philadelphia, has been appointed vice-president and general manager, succeeding O. C. SKINNER as general manager. R. NEVIN WATT has been made sales manager, and G. H. LEWIS, works manager. Effective April 26, the company's general offices will be moved to its plant at Burnham, Mifflin County, Pa. H. J. SNOWDEN, formerly in the St. Louis office, has been placed in charge of the Philadelphia district office, and M. H. MCCURDY will assist him.

D. K. CRAMPTON, metallurgist, Chase Companies, Inc., will be the speaker at a meeting of the New Haven chapter of the American Society for Steel Treating, to be held in the Chase Auditorium, Waterbury, Conn., April 17. His address will be on the "Manufacture and Testing of Brass."

FREDRIK WILLE, chief engineer, H. A. Brassert & Co., Chicago, has sailed for England on a business trip.

CLYDE E. WILLIAMS, a member of the staff of the Battelle Memorial Institute since September, has been appointed assistant director. Previous to his association with the institute he was chief metallurgist for the Columbia Steel Corporation, San Francisco. For many years Mr. Williams was with the United States Bureau of Mines and is best known for his work on sponge iron, electric furnace cast iron and refractories. After his graduation from the University of Utah he was employed in the lead and copper smelting industry, going from there to the Bureau of Mines to assist in work on alloy steels and ferro-



Clyde E. Williams



alloys that was carried on by the bureau for the War and Navy Departments.

NORRIS J. CLARKE, vice-president, Lamson & Sessions Co., and JOHN A. COAKLEY, traffic manager of American Steel & Wire Co., Cleveland, have been elected directors of the Cleveland Chamber of Commerce.

CHARLES E. MITCHELL, associate manager of the Gray Iron Institute, Cleveland, will speak on "Foundry Costs" at a meeting of the Pittsburgh Foundrymen's Association, to be held at the Fort Pitt Hotel on April 25.

JAMES P. ALLEN, who retired a few months ago as president of the Union Steel Casting Co., Pittsburgh, when that concern was absorbed by the Blaw-Knox Co., Blawnox, Pa., has been elected a director of the Machined Steel Castings Co., Alliance, Ohio, affiliated with the Alliance Machine Co.

L. R. TIERNEY, for the past 13 years associated with Rogers Brown & Crocker Brothers, Inc., has resigned to accept a position in the sales department of the Mystic Iron Works, Boston. Mr. Tierney's long association with the industry has made him one of the most widely known pig iron men in the East. He will make his headquarters in New York, and will represent the Mystic Iron Works not only in that State, but also in a part of Connecticut.

O. J. HARMS has been promoted to the position of sales manager and G. M. BABST has been made manager of the sales promotion department of the Johnson Motor Co., Waukegan, Ill. Mr. Harms has had a wide business experience in almost every country in the world. Mr. Babst is the author of several published industrial sales promotion plans and has had extensive experience in the automotive field with the Ford Motor Co., the Chevrolet Motor Co., and Willys-Overland, Inc.

E. T. WEIR, chairman of the National Steel Corporation, has been elected a director of the Fidelity Title & Trust Co., Pittsburgh.

H. D. GATES, sales manager of the Pangborn Corporation, Hagerstown, Md., and RUSSELL HUNT, sales manager of the Sloss-Sheffield Steel & Iron Co., Birmingham, were the speakers at the April meeting of the New England Foundrymen's Association, held last week in Boston.

WALTER M. SAUNDERS, of Providence, R. I., is to be the speaker at

the April meeting of the Associated Brass Founders of New England, to be held at the Engineers' Club, Boston, on April 23.

GEORGE E. SHAW has been appointed purchasing agent for the Robertson division of the Universal Aviation Corporation, a unit of the American Airways, with headquarters at Lambert-St. Louis Field, St. Louis. He was formerly assistant purchasing agent for the Southern Air Transport division of the American Airways at Fort Worth, Tex.

GILBERT L. LACHER and CLARENCE E. WRIGHT have been appointed managing editor and news editor, respectively, of THE IRON AGE. Mr. Lacher became identified with this journal on Feb. 17, 1919, as Western editor, resident in Chicago, and was brought to the headquarters office in 1925. Mr. Wright has been a member of the editorial staff since June 10, 1917, and both Mr. Wright and Mr. Lacher have been associate editors for the past four years.

WILLIS D. GLENDENING has been transferred from Fort Wayne, Ind., to a new coil winding factory of the Canadian Wire & Cable Co., Toronto, Canada, which is associated with the Dudlow Mfg. Co. of Fort Wayne.

ROBERT R. OSBORN, project engineer of the Curtiss Aeroplane & Motor Co., was a guest at a joint meeting of the Hartford and New Britain chapters of the American Society of Mechanical Engineers at New Britain, Conn., on April 8.

E. T. ICKES, metallurgical engineer, Columbia Steel & Shafting Co., on April 10 spoke on steel making at a meeting of the Purchasing Agents' Association of Western Massachusetts at Springfield.

ALFRED H. SCHUTTE, SR., of the company of the same name, Cologne, Germany, arrived on the Bremen on April 9 to visit some of his old friends in this country. HANS BILLETER, of Billeter & Klunz, machine tool manufacturers, Aschersleben, Germany, and R. UHLIG, chief engineer, Rudolf Schonherr, Chemnitz, Germany, arrived on the same boat.

ALEXANDER E. WALKER, who has been general manager of sales of Republic Iron & Steel Co., Youngstown, has been appointed assistant vice-president in charge of sales of the Republic Steel Corporation.

ARTHUR J. TUSCANY, manager, Gray Iron Institute, Cleveland, will address the Newark Foundrymen's Association, Newark, N. J., on April 23 at the Down Town Club. His subject will be "The Gray Iron Industry Wakes Up."

T. W. ROBINSON, vice-president, Illinois Steel Co., will sail April 19 for a two months' vacation in Italy.

PHILLIPS ISHAM, 30 Church Street, New York, has been appointed sales agent in the New York district, including Connecticut, Rhode Island, New York City and eastern New Jersey, for the Tonawanda Iron Corporation, Buffalo.

## National Foreign Trade Convention

The National Foreign Trade Council will hold its seventeenth convention in Los Angeles on May 21, 22 and 23. Two thousand delegates, representing 35 States, are expected to attend.

The program includes addresses by Edward A. Sumner, American Radiator Co., and vice-president of the American Chamber of Commerce in France, on "Some Aids to American Business in Europe"; by H. G. Smith, Bethlehem Shipbuilding Corporation and president of the National Council of American Shipbuilders, on "American Ships and Shipbuilding"; by C. M. Peter, export manager, Black & Decker Mfg. Co., Baltimore, on "What the Export Manager Demands From His Advertising," and by Gen. Palmer E. Pierce, assistant to the president, Standard Oil Co. of New Jersey, on "American Business in Latin America."

There will be numerous other addresses and a feature of the opening night will be a world trade banquet, with greetings from distinguished representatives from Japan, Latin America and several European countries.

## Scholarships for Metal Study Donated by Jackling

A fund of \$600,000 has been established by D. C. Jackling, president, Utah Copper Co., at Missouri School of Mines and Metallurgy at Rolla, Mo., the income from which is to be used for student loans and scholarships. This supplements loan funds established by the donor 20 years ago, and which meanwhile have aided over 300 students. The school will now be able to make outright gifts to exceptional undergraduates of a major fraction of their expenses, to grant scholarships for advanced study either in America or abroad, and to foreign students for study in America.



# ▲ ▲ ▲ OBITUARY ▲ ▲ ▲

LOUIS JACOB AFFELDER, since 1924 division contracting manager at Pittsburgh for the American Bridge Co., died suddenly at his home in that city on April 8, aged 59 years. He was born at Pittsburgh and attended school there, having been graduated from the Western University of Pennsylvania, now the University of

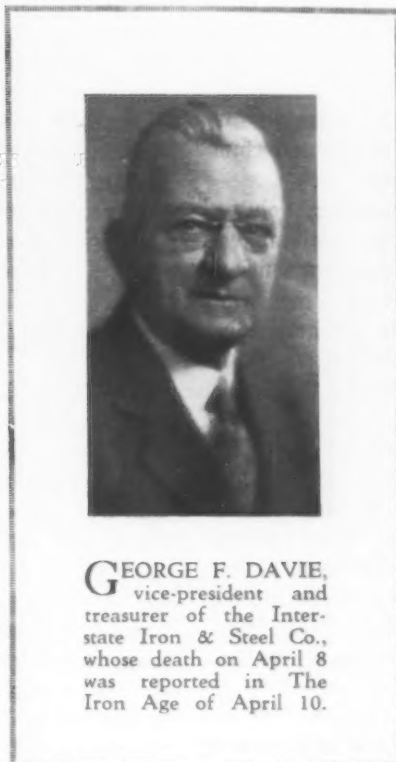


Louis J. Affelder

Pittsburgh. After leaving college he became identified with the Bridge company and had served it and predecessor companies for 35 years. Mr. Affelder was widely known because of his extensive philanthropic activities both in Pittsburgh and in the country as a whole. At the time of his death he was president of the Irene Kaufmann Settlement and prominently identified with many other charitable and welfare organizations. He was also a member of the American Society of Civil Engineers, the Engineers Society of Western Pennsylvania and the Pittsburgh Chamber of Commerce.

ERNST KRAUSE, president, Ernst Krause Co., Vienna, and formerly with Schuchardt & Schutte, died in Vienna, on March 30, aged 62 years.

ALFRED BROTHERHOOD, formerly with Manning, Maxwell & Moore, and one of the founders of that company's machine tool department, died suddenly at his home in East Aurora, N. Y., on April 1, aged 83 years. He came to this country in 1867 from England and obtained a position as paymaster with the Delaware & Hudson Coal Co. Later he became associated with the Taylor Iron Works, Charleston, S. C. He then moved to New York, where he established the machine tool department for Cook & Beggs. He retired in 1907.



GEORGE F. DAVIE, vice-president and treasurer of the Interstate Iron & Steel Co., whose death on April 8 was reported in The Iron Age of April 10.

FRANK JEROME DUTCHER, who retired from the presidency of the Draper Corporation, Hopedale, Mass., textile machinery, last June, died April 13 at his home in that town, aged 80 years. He was made president of the Draper Corporation in 1909.

BRAINERD F. PHILLIPSON, whose death was briefly reported in THE IRON AGE of April 10, was a pioneer in the development of the use of molybdenum in alloy steel both in this country and in foreign countries. He was graduated from Columbia University in 1913 as a chemical engineer, and was not 40 years old when he died. After graduation he became connected with the American Metal Co., New York. In 1918 the Climax



Brainerd F. Phillipson

Molybdenum Co. was formed by the American Metal Co., and Mr. Phillipson immediately became connected with it. Soon after this he assumed the presidency, which office he held at the time of his death.

ERIC H. JOHNSON, proprietor of the Johnson & Biddle Tool Co., Elkhart, Ind., died March 28 as result of a heart ailment and a nervous breakdown. He was born March 3, 1886, in Nassjo, Sweden.

CHARLES R. TURN, general manager of the International Boiler Works Co., East Stroudsburg, Pa., died on April 10.

## Steel Rates to Topeka, Kan., May Be Reduced

WASHINGTON, April 15.—Reductions ranging from 4c. to 29c. per 100 lb. would be made in rates on steel products, in carloads, from producing points over the country to Topeka and to other destinations in Kansas when fabricated in transit at Topeka if the Interstate Commerce Commission approves a proposed report of Examiner D. C. Dillon, made public yesterday.

The report, growing out of a complaint by the Topeka Chamber of Commerce and a number of corporations dealing in iron or steel articles in Topeka, held that existing rates are unreasonable. The points of origin are St. Louis, Chicago, Ashland, Ky., Middletown, Youngstown, Pittsburgh, Bethlehem and Wheeling.

The examiner in prescribing rates to Topeka, said that rates to other destinations in Kansas should be made by adding to the rates applied to Topeka arbitraries which repre-

sent the difference between rates for the distance to Topeka and the distances to the other destinations under the Kansas-Missouri scale column providing 32.5 per cent of the first class rate.

The proposed and present rates to Topeka, per 100 lb., the latter in parentheses, follow: From St. Louis, 40c. (44c.); Chicago, 47c. (54c.); Ashland, 60c. (75.5c.); Youngstown, 62c. (77c.); Pittsburgh, 63c. (82c.); Bethlehem, 74c. (\$1.03); Wheeling, 62c. (82c.); Middletown, 56c. (71c.).

W. W. MACON  
*Editor*

# THE IRON AGE

A. I. FINDLEY  
*Editor Emeritus*

ESTABLISHED 1855

## Appearances as to Unemployment

IN last week's issue we referred pointedly to the great need of much more study, from statistical and other standpoints, of unemployment. As is well known, accurate information has not been available. The census report, which will not be forthcoming for several months, will give us only one figure and thus there will be no basis for studying trends.

On account of changed conditions a given volume of unemployment, including lack of full-time employment, does not attract the same amount of attention as before these changes occurred. Any old timer who has an idea that the appearance of soup kitchens constitutes the real signal to sit up and take notice has a standard that is out of date, if it be granted that such a criterion ever was reliable.

While there is truth in the statement that the luxury of yesterday becomes the necessity of today, it is giving the word "necessity" a broad meaning—what the individual considers a necessity, not what Nature decrees is a necessity. Nature sets only food, clothing and housing. The individual today may be forced to do without many things he considers necessities without his case coming to public notice, as would have been the case in the old days when lack of food, clothing or shelter came immediately to light. It is possible for those in employment to deny themselves things recently come to be regarded as necessities in order to help relatives and friends whose income is interrupted, and beyond doubt a great deal more of that is being done now than in depressions of long ago.

In the second place, in the family the proportion of gainfully employed to total number of members has increased sharply, and that makes a big difference. When there was one breadwinner to the family the loss of that job stopped the family income entirely. If there are three the loss of one job out of the three is serious, but the case does not come to public attention in the same way.

A third very important consideration is the greatly increased effort employers now make to distribute employment among the greatest possible number. When in the old days one man out of three was dropped that man became conspicuous. If three men are reduced to two-thirds time these cases do not become conspicuous.

These three changes make it that a given amount of unemployment, in the sense of a deficiency in total employment from full-time employment of all workers, is much less conspicuous to the ordinary everyday ob-

server than the same deficiency would have been years ago. Judging by mere appearances, on the basis of former methods of observation, is to be avoided.

A broad, long-time study, however, such as we have been advocating, has little to do with the current ups and downs. No doubt employment is now undergoing a seasonal increase and we may trust that the depression is not great and is likely to wear off month by month. Below all this lies a deeper matter, commonly referred to for convenience as "technological unemployment."

## Some Super-Statistics Needed

A STORY has often been told of Li Hung Chang. An enthusiastic American related how he had boarded a train at New York at a certain time and in only so many hours afterward he was in Chicago. The well-poised Chinese diplomat then asked: "And what did you do when you got there?"

We are proud of our large and increasing supply of statistics relating to all phases of business, but there is ground for a question likely in many cases to prove embarrassing: "What do we do with the statistics when we have them?" Really we stand in need of some super-statistics, to show how, in what manner and to what extent, we modify our conduct in the light of the information that has been supplied.

To start with a broad question, a certain amount of work is involved in compiling any set of statistics. Is the attention given to the statistics by the recipients commensurate with the labor that was involved? The theory as to the value of the statistics, leading to their compilation, may have been correct, but the recipients may not conduct themselves according to that theory.

Taking a specific case, there are certain trade statistics which show respectively orders, production and shipments. Are the figures carefully compared, to show whether production is running above or below shipments, indicating a favorable or adverse change in stocks, and whether orders and shipments indicate an increase or decrease in the order book?

Again, when the individual member of an industry receives statistics showing a certain increase in total capacity of the industry, what is his reaction in case the increase seems rather large? He may be moved to curtail his own expansion, for the general good, or he may be moved to fresh expansion on the



principle of "keeping pace with his competitors." If the records of all industries during the last few years were studied, cases would be found in which an industry operating at successively lower rates, on account of increasing capacity, continued to expand through competitive building instead of curtailing to allow the general slack to be taken up.

Perhaps we take a disproportionate and undue interest in the broad question, "How's business?" The individual is endeavoring to carry a mental composite, drawing an additional line with each fresh piece of statistical news whereby the core of the composite line is moved a trifle. The composite is likely to be quite blurred when, if the items were segregated to make a series of composite lines, these would be much blacker and the divergences one from another would be illuminating.

Suppose business is going to get better or worse, precisely what are you going to do about it? One may indeed be seeking the business news as a means of influencing his feelings more than as a basis for modifying his conduct. We like to hear that business is growing better and our interest may have too much of the emotional and not enough of the practical about it. Then, from the practical aspect, if business is reported poorer, it would be interesting to have statistics of how many men thereupon resolve to redouble their sales effort and how many determine to reconcile themselves to a smaller volume of sales.

### Engineers in Government Service

**I**MMEASURABLY helpful to American business as has been the Department of Commerce, THE IRON AGE has a suggestion which should go to improve the service. This is that more engineers should be on the Department's staff both at home and abroad. It is not that engineers *per se* are needed, but business-minded men who are so well acquainted with technology that their searches and reports convey accurate and convincing information. Conditions today justify more technicians in the organization than there are.

The Department of Commerce in recent years has grown enormously. It is one of the really large business organizations of the United States. When it occupies its new building in a few months it will probably be in the largest building in Washington, substantially the size of the capitol itself, but thanks to progress in architecture, with greatly increased facilities. Its great value, however, lies in the fact that the business man can find here probably the greatest pool of business information that exists and he can dip from this pool information of literally endless variety.

Although no other government maintains an equal organization, the Department of Commerce is not yet living up to its full opportunities. Reports have sometimes lacked conviction. They were difficult to take at face value. They seemed to suggest that the writer was deficient in a knowledge of the subjects covered.

It is of course realized that the department is limited in its appropriations, that its salary rates are deliberately maintained below those of the typical business enterprise, in order to avoid competition with

business. It is obviously difficult to maintain a satisfactory staff in fifty-six offices in forty different countries. It is easy to err in selecting personnel for distant offices; where "there ain't no Ten Commandments" they sometimes do the worse.

The typical engineer will usually be found well informed regarding the technical aspects of business problems. He usually has a practical turn of mind and will not get lost among the academic aspects of economics in such work. Instead he will be disposed to assist the business man with directness and conciseness and probably along business lines.

There is a message in this for our engineers. The Department of Commerce should offer employment that is at once practical, interesting and valuable and likely to prove a stepping-stone to a larger future. As this is the time of the year when the officials of the department plan for the fiscal year beginning July 1, and as additional personnel will probably be required, it is a fitting time for engineers to investigate.

### Research Grows Apace

**W**HILE a good idea of the diversity of work now prosecuted at Mellon Institute of Industrial Research can be had only by an inspection of the premises, certain figures from Director Weidlein's annual report are illuminating.

It may be recalled that the building in Schenley Park, Pittsburgh, was opened shortly before the war, and offered facilities for the "practical cooperation between science and industry." The start was slow. It took the various industries some years to discover that they had problems capable of solution by scientific research. But this discovery eventually was made. In fact nearly a million dollars was contributed last year to the institution by donors of industrial fellowships.

Sixty to seventy organized investigations, requiring the entire time of about 200 researchers, are constantly in progress. Eight of these programs are supported by industrial associations—investigations of problems common to an industry, and whose solution is recognized as being a proper charge against the industry rather than any single firm. Another significant fact (indicating that good results continue to flow from extended programs) is that 29 fellowships have been in operation for five years or more, and 15 of these have completed more than ten years of work.

### Pressing Now for Home Building

**E**XPANDED residential building is one of the keys to better business. There can be speeding up if opportunities are taken to tell in one's community some of the facts. Apart from a number of instances, there still is need for housing. Surveys of building authorities so indicate. House building has not been overdone to the extent that has been somewhat readily believed. In recent months activity has been less than at any time since 1921.

The news that calls for spreading is that money is available in considerable abundance. One New York bank recently transferred \$200,000,000 to town

and country banks. The average banker now is taking a right-about-face attitude. He appears to be looking for borrowers and not barricading himself against them. Building interests are fearful that, if something is not done quickly, the money will gravitate back to, say, New York, to go into speculation and thus residence building will be postponed.

The wish is for a maximum of advertising of the changed situation in all localities. Few would-be house buyers are believed to be aware of the easier conditions. Behind the movement is the desire among manufacturers to forestall the postponement and thereby accelerate the uptrend in the curve of business activity.

The fact of the general interest among the informed is the implication that everything reasonable will be done to accommodate the man able to establish only a small equity. Naturally all of this is predicated on the assumption, the need being clear, that further reductions in cost of labor and materials are hardly to be expected. This concerted asking for help to expedite justifiable building construction stands for another illustration of the possibilities of shaping, if not controlling, the business cycle.

### The Irreducible Accident Minimum

**T**WELVE months now completed of the inter-city industrial accident contest conducted by the National Safety Council seems to demonstrate there is irreducible minimum. It appears that, no matter how great and intelligent the effort may be, accidents can be reduced in number and average severity only to a certain point for a given plant or group of plants.

The contest chanced to be peculiarly well organized to permit a study of this phase of the prevention question. Of the twelve contestants, eleven had had little or no experience in attacking industrial hazards under the stimulus of competition. These were Baltimore, Blackstone Valley (a group of communities in Massachusetts and Rhode Island), Chattanooga, Chicago, Delaware, Detroit, Kansas City, Louisville,

Providence, Richmond, and Springfield, Mass. Set against them as the twelfth city of the group was Worcester, Mass., where the competitive plan originated and where it has been carried on among local plants for more than a decade.

Wisely, the Safety Council is not conducting the contest on the basis of the lowest accident frequency and severity, but according to the greatest percentage of improvement from month to month. Worcester, consistently with the best actual record, fell far down in the ranking. In the last six months of the year its position was tenth. Most of the other communities showed far greater improvement, as was to be expected. They had not approached closely to the irreducible minimum.

One by one those cities which continue in the contest should establish each its own minimum. Probably no two will be alike, owing to local influences. For example, Worcester's minimum is low, a chief reason being the extraordinary results which have been obtained in the plants of the Worcester Works of the American Steel & Wire Co. and the Norton Co. Taking all the cities aggregating 1,347,000,000 working hours, the accident frequency was 17.97 per one million hours worked, and the accident severity 0.94, (a figure obtained by dividing the number of days lost by the number of accidents and the result multiplied by 1000). The Worcester rate for frequency was 10.18 and for severity, 0.41. The 24,183 employees worked 58 million hours, during which time they suffered 593 accidents. The employees of the American Steel & Wire Co. and Norton Co. worked 20 million hours with only 59 accidents. Accounting for one-third of all the hours, the plants of the two companies were charged with only one-tenth of the total accidents.

No matter what the minimum of the industries of a given city may come to be, the difference between it and the rates before the contest was undertaken must always translate itself into a great saving of life and limb and human suffering and of days of useful employment, and further, a corresponding decrease in the number of idle hours of equipment and in the rate of labor turnover.

## High-Frequency and Arc Electric Furnaces Compared

**C**OMPARATIVE data of the current consumption in the high-frequency furnace and the arc furnace in the melting down of cold scrap are given by H. Neuhauss in *Stahl und Eisen*, vol. 49, page 689. High-frequency furnaces of 90, 145, 240 and 500-lb. capacities respectively consume 1270, 1050, 770 and 725 kwhr. per ton of steel produced, while arc furnaces of 4, 6 and 8-ton capacities required respectively 670, 550 and about 480 kwhr. to the ton.

It is stated that in a high-frequency furnace of 1-ton capacity the current consumption may be expected to be equivalent to that in a modern arc furnace of equal size. The real advantages of the high-frequency furnaces are of a metallurgical kind, and trials made at Trenton, N. J., have proved that it is quite possible to produce in such furnaces a low-carbon steel of the composition (carbon 0.025 per cent, silicon 0.07, manganese 0.15, phosphorus

0.005, and sulphur 0.010 per cent) that is entirely free from red shortness and is capable of being drawn into a perfect seamless tube.

Copper steel and Toncan metal were also produced and rolled into seamless tubes. Corrosion tests are in progress and it is expected that, owing to the freedom from oxide inclusions, these corrosion-resistant materials made in the high-frequency furnace will prove much superior in respect to their non-corrosive properties. The composition of Toncan iron, the article records, is carbon 0.2 to 0.3, phosphorus 0.02, sulphur 0.04 per cent, with not less than 0.2 per cent copper and 0.07 per cent molybdenum.

The high-frequency furnace readily lends itself to other applications, such as in combination with a cupola, to enable the working of a duplex process, for the manufacture of carbon-free ferrochrome, and for the rustless chromium steels.



## The Week in Business

Drift of Current Financial  
and Economic Opinion

ONE factor in the building situation which has been brought out recently is that the gap between this year's volume and that of the corresponding period of last year is progressively narrowing. (F. W. Dodge Co.) This lends strength to the belief that the swing into large-scale operations is already taking effect. One opinion (*Standard Statistics*) is that construction as a whole will be slightly larger than last year, but that the best comparative showing will not be made until the second half year.

But little definite improvement in the general situation is noted, and *Business Week* considers the "seasonal stimulus" to be weak. The same view is held by *Annalist*, which says that each of the seven components of its index of business activity so far reported for March shows a downward tendency.

It is not seriously disputed anywhere, says a writer in *Commerce and Finance*, that "declining prices have everywhere contributed to—if not actually caused—the present depression in business," which is world-wide. No more subtle (and dangerous) method exists of trans-

ferring wealth from one class to another, thinks this writer, than an alteration of the price level. While this reasoning is based upon depreciation of currency, it is believed applicable to any major movement in prices.

Continued improvement in the commodity price situation is noted by the Harvard Economic Society. Another commentator refers to "many movements throughout the world, in a class with the Farm Board's objective to control supply and demand artificially." He points to the Brazilian coffee valorization plan, the Cuban cooperative sugar manipulation, a new international association of rubber producers under Dutch auspices, and the Copper Export Association's 18c. copper—although the last has now sharply cut the price 4c. to start a buying movement—which seems likely. And "the worst attempt to meddle with prices and upset the American business world is the deplorable Congressional tariff campaign," he says.

Despite the heavy slackening in many lines of production, the National Industrial Conference Board finds "a number of instances where the amount of stocks indicates that

the curtailment in production was not great enough." That this situation did not extend to retail trade is "indicated by an increase in the number of rush orders."

This organization finds mid-April current business either marking time or slightly receding. But "miscellaneous predictions are rosier than a month ago. And the stock market is behaving in a manner which, until the past two years, would have been interpreted as forecasting immediate industrial and commercial expansion to new high marks."

Railroad circles complain of a poor rate of return, as the February revenue was at an annual 3.76 per cent only, compared with 6.27 per cent a year before. This situation is regarded as the cause of withdrawal of much railroad support from the announced construction program. This, it is pointed out, is the reverse of E. H. Harriman's "proverbial policies, to issue loans and buy equipment by preference in a period of business depression, on the ground that, even if railroad earnings be bad, money was easy and prices in the steel market were then usually low."

### New Hydraulic Laboratory at Bureau of Standards

WASHINGTON, April 15.—The O'Connor bill, appropriating \$350,000 for a national hydraulic laboratory in the Bureau of Standards, was passed by the House of Representatives last week. The laboratory will be used to make tests and experiments in hydraulic research and engineering.

### Southern Pig Iron Rates to East Continued

WASHINGTON, April 11.—Reduced rates on pig iron from Southern blast furnaces through South Atlantic and Gulf ports to Eastern trunk line and New England territories, which were put into effect last June, will be continued until Sept. 30. The tariffs were filed to expire March 31, but request for their continuation was asked by the Southern carriers and steamship lines participating in the traffic. Eastern trunk line railroads and operators of Eastern blast furnaces strongly opposed extension of

the tariffs. Both sides presented their case to the investigation and suspension board of the Interstate Commerce Commission. The commission yesterday voted not to suspend the tariffs.

### Forged Steel Drums Made in Sheffield

SHEFFIELD, ENGLAND, April 2.—Production of seamless, hollow-forged steel drums is a recent development of the heavy steel industry in Sheffield. The English Steel Corporation has an export order for 74 drums, which will require the production of about 5600 tons of ingots. Two orders booked by John Brown & Co. call for 25 large drums for high-pressure boilers in a new power station at Thornhill and an extension of the Sheffield Corporation boiler installation. The English Steel Corporation recently completed an order for 24 drums, the largest of which were 44 ft. long and 5 ft. in diameter, with a 4½-in. wall.

### New Ocean Route May Require Five Ships

WASHINGTON, April 15.—Five American-built, 16-knot passenger and freight vessels of the latest type will be required if the interdepartmental subcommittee on merchant marine, after a hearing next Tuesday, approves the establishment of a proposed ocean passenger, freight and mail service from Atlantic ports through the Panama Canal to Pacific Coast ports and to the Orient. It is assumed that the parent committee will act favorably on the recommendation made by the subcommittee, of which Assistant Postmaster General W. Irving Glover is chairman.

Bids will be opened April 25 by the United States Naval Torpedo Station, Newport, R. I., on 200 tons of iron and steel borings and turnings, about 25 tons of miscellaneous iron and steel scrap, 32 tons of brass, copper and bronze, and 2 tons of Monel metal turnings and borings.

# Iron and Steel Markets

## Steel Business Holds Its Own

With Seasonal Influences at Work, Ingot Output Makes  
Slight Gain—Shipments to Automobile  
Industry Improve

**I**RON and steel business is holding its own and in some lines has made moderate seasonal gains. Cleveland steel works, reflecting larger releases from the automobile industry, have raised production to 85 per cent, compared with 76 per cent of ingot capacity a week ago. The Youngstown district, which has been making steel at a lower rate than centers with more diversified output, is now operating at 70 to 75 per cent of capacity and expects second quarter production to exceed that of the first quarter by 10 per cent.

Operations in other centers, however, are substantially unchanged, and the average for the country at large is 78 per cent, compared with 76 per cent last week. The Steel Corporation rate remains at 77 to 78 per cent.

The steel industry thus far this year has made a surprisingly good showing, in view of the general business recession, and producers will be satisfied if output can be maintained at the present rate. Crude steel is no longer being piled in anticipation of expanding consumption, and the schedules of both open-hearth plants and finishing mills are in close step with current demand.

Increases in motor car production are mainly by manufacturers in the lower price range, and spring sales of automobile dealers have not yet got under way in volume. Nevertheless the automobile industry's requirements in materials in the first half of this month have been appreciably larger than in the corresponding part of March. Specifications for hot-rolled strip have gained 10 per cent, and shipments of pig iron, 15 to 20 per cent.

Building prospects are more hopeful, although construction work is rather slow in getting under way. Fabricated steel awards, at 29,000 tons, are light, but 38,000 tons has been added to the pending list. The sharp drop in copper, from 18c. to 14c., is counted on to hasten the placing of public utility projects, including central stations and transmission towers. Metal lath manufacturers are taking considerable sheet steel, but other makers of sheet steel building products are not active. Leading radiator and sanitary ware plants are running at less than half of capacity.

Activity in railroad equipment is at a low ebb, but the Illinois Central has entered the market for 20 suburban cars and is expected to issue inquiries shortly for freight cars. Mills are still shipping considerable steel to railroad equipment builders, and Chicago producers are also supplying large tonnages of plates to the Milwaukee fabricator of line pipe.

Revision of plans and specifications will delay the award of contracts for a number of ocean vessels.

The Steel Corporation's gain in unfilled orders in March—90,905 tons—exceeded expectations. The increase is probably accounted for by the entering of quarterly contract tonnage. Contracts represent live obligations to the extent that specifications are released against them, and specifying is cautious in a sensitive market.

Prices of heavier finished products have become more flexible. Plates and shapes, heretofore held rather generally at a minimum of 1.80c., Pittsburgh, have been shaded \$1 and sometimes \$2 a ton. Delivered prices on plates and shapes at New York are off \$1 a ton. Competition in wire nails has been complicated by sales by importers at \$2 a keg, Pittsburgh basis. Irregularities have again appeared in manufacturers' wire, with orders at \$2.30 reported.

Pig iron melt is gradually improving, but buying is at close range except for occasional purchases induced by bargain prices. Scrap markets are listless, with indications that prices have struck dead center.

Furnace coke is weak at \$2.60 a net ton, Connellsville, with concessions not uncommon on spot business. Production is being curtailed but still exceeds demand.

Copper for export was reduced April 15 from 18.30c. to 14.30c. a lb., c.i.f. Electrolytic metal for domestic delivery also went down 4c. to 14c., Connecticut valley. The reduction occurred just one year after the 18c. price was established.

THE IRON AGE composite price for pig iron remains unchanged at \$17.75 a gross ton for the seventh week, the longest period in more than a year. Finished steel is unchanged at 2.264c. for the third week.



# A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,  
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Apr. 15, 1930	Apr. 8, 1930	Mar. 18, 1930	Apr. 16, 1929
No. 2 fdy., Philadelphia.....	\$20.26	\$20.26	\$20.26	\$21.76
No. 2, Valley furnace.....	18.50	18.50	18.50	18.00
No. 2 Southern, Cincinnati..	16.69	16.69	16.69	18.69
No. 2, Birmingham.....	14.00	14.00	14.00	15.50
No. 2 foundry, Chicago*.....	19.50	19.50	19.50	20.00
Basic, del'd eastern Pa.....	19.00	19.00	19.00	20.25
Basic, Valley furnace.....	18.50	18.50	18.50	18.00
Valley Bessemer, del'd P'gh..	20.76	20.76	20.76	20.26
Malleable, Chicago*.....	19.50	19.50	19.50	20.00
Malleable, Valley.....	19.00	19.00	19.00	18.50
L. S. charcoal, Chicago.....	27.04	27.04	23.04	27.04
Ferromanganese, furnace....	94.00	94.00	94.00	105.00

Rails, Billets, Etc., Per Gross Ton:	Apr. 15, 1930	Apr. 8, 1930	Mar. 18, 1930	Apr. 16, 1929
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh..	33.00	33.00	33.00	34.00
Sheet bars, Pittsburgh.....	33.00	33.00	33.00	35.00
Slabs, Pittsburgh.....	33.00	33.00	33.00	34.00
Forging billets, Pittsburgh....	38.00	38.00	38.00	39.00
Wire rods, Pittsburgh.....	38.00	38.00	38.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.85	1.85	1.85	1.85

Finished Steel,	Apr. 15, 1930	Apr. 8, 1930	Mar. 18, 1930	Apr. 16, 1929
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.80	1.80	1.85	1.95
Bars, Chicago.....	1.90	1.90	1.95	2.05
Bars, Cleveland.....	1.80	1.80	1.85	1.95
Bars, New York.....	2.14	2.14	2.19	2.29
Tank plates, Pittsburgh.....	1.80	1.80	1.80	1.95
Tank plates, Chicago.....	1.90	1.90	1.95	2.05
Tank plates, New York.....	2.02½	2.07½	2.07½	2.22½
Structural shapes, Pittsburgh..	1.80	1.80	1.80	1.95
Structural shapes, Chicago....	1.90	1.90	1.95	2.05
Structural shapes, New York..	1.99½	2.04½	2.04½	2.19½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.30
Hot-rolled strips, Pittsburgh..	1.70	1.70	1.80	1.90
Cold-rolled strips, Pittsburgh.	2.55	2.55	2.55	2.75

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages

Finished Steel,	Apr. 15, 1930	Apr. 8, 1930	Mar. 18, 1930	Apr. 16, 1929
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh...	2.55	2.55	2.65	2.85
Sheets, black, No. 24, Chicago				
dist. mill.....	2.65	2.65	2.75	3.05
Sheets, galv., No. 24, P'gh...	3.30	3.30	3.30	3.60
Sheets, galv., No. 24, Chicago				
dist. mill.....	3.40	3.40	3.40	3.80
Sheets, blue, No. 13, P'gh...	2.25	2.25	2.25	2.20
Sheets, blue, No. 13, Chicago				
dist. mill.....	2.35	2.35	2.35	2.40
Wire nails, Pittsburgh.....	2.15	2.15	2.25	2.65
Wire nails, Chicago dist. mill	2.25	2.35	2.35	2.70
Plain wire, Pittsburgh.....	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill.	2.45	2.45	2.45	2.55
Barbed wire, galv., Pittsburgh	2.95	2.95	2.95	3.30
Barbed wire, galv., Chicago				
dist. mill.....	3.00	3.00	3.00	3.35
Tin plate, 100 lb. box, P'gh...	\$5.25	\$5.25	\$5.25	\$5.35

Old Material, Per Gross Ton:	Apr. 15, 1930	Apr. 8, 1930	Mar. 18, 1930	Apr. 16, 1929
Heavy melting steel, P'gh....	\$16.00	\$16.00	\$16.50	\$18.75
Heavy melting steel, Phila....	14.00	14.00	15.00	17.00
Heavy melting steel, Ch'go....	13.00	13.00	13.25	16.00
Carwheels, Chicago.....	14.50	14.50	14.50	14.50
Carwheels, Philadelphia.....	15.00	15.00	15.00	16.50
No. 1 cast, Pittsburgh.....	14.50	14.50	14.50	15.50
No. 1 cast, Philadelphia.....	15.00	15.00	15.00	16.50
No. 1 cast, Ch'go (net ton)...	13.50	13.50	13.75	16.00
No. 1 RR. wrot., Phila.....	15.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)...	12.25	12.25	12.25	14.00

Coke, Connellsville,	Apr. 15, 1930	Apr. 8, 1930	Mar. 18, 1930	Apr. 16, 1929
Per Net Ton at Oven:				
Furnace coke, prompt.....	\$2.60	\$2.60	\$2.60	\$2.75
Foundry coke, prompt.....	3.50	3.50	3.50	3.75

Metals,	Apr. 15, 1930	Apr. 8, 1930	Mar. 18, 1930	Apr. 16, 1929
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	14.12½	18.12½	18.12½	18.12½
Electrolytic copper, refinery..	13.75	17.75	17.75	17.75
Tin (Straits), New York.....	36.37½	36.37½	36.12½	45.62½
Zinc, East St. Louis.....	4.90	5.00	4.95	6.65
Zinc, New York.....	5.25	5.35	5.30	7.00
Lead, St. Louis.....	5.40	5.40	5.40	6.85
Lead, New York.....	5.50	5.50	5.50	7.00
Antimony (Asiatic), N. Y. ..	8.00	8.00	8.00	9.75

## PITTSBURGH:

Mill Schedules Closely Adjusted to  
Moderately Better Current Demands

PITTSBURGH, April 15.—While increases in specifications for steel products have been barely perceptible in the last few weeks, most producers report a slight gain in aggregate tonnage releases during the first half of April as compared with the corresponding March period. On the other hand, steel ingot operations have not been stepped up, but this may be explained by the fact that steel companies are not stocking crude steel in anticipation of a heavier demand later.

Schedules of both open-hearth plants and finishing mills are now closely adjusted to current demand, and any further increases in operations will reflect a better demand for steel.

Although prospects for the building industry are more hopeful, any improvement in the demand for pipe, structural steel, reinforcing bars and other products for which new construction is the chief outlet, must be interpreted as largely seasonal. Metal lath makers are taking out considerable sheet steel, but other makers of sheet steel building products are not active. The leading radiator and sanitary ware plants in the district are running at less than 50 per cent of normal capacity.

Railroad buying is no longer a feature of the steel market, although

Eastern roads plan to spread their shipments of rails over a longer period than usual this year, and this policy is expected to benefit the mills later in the year.

Specifications for tin plate have not been so heavy in the last week or two, but it is too early to form any reliable estimate of crop acreages, and the canning companies, as well as the container manufacturers, are marking time. No adverse crop reports have been circulated in this district as yet, and tin mill schedules continue at 85 to 90 per cent of capacity.

The price situation shows no marked

change, and it is more and more evident that steel demand has not yet expanded sufficiently to afford producers an opportunity to get higher prices. On nearly all products a few makers are aggressive enough in seeking tonnage to continue the market weakness, and, with consumers generally apathetic toward their future needs, they can scarcely be blamed for the low prices which have appeared.

Steps are being taken to stabilize the wire nail market, which has been badly demoralized in the last two weeks, and in the immediate Pittsburgh district no sales at less than \$2.20 are reported. Strip steel is becoming stabilized at recent levels. On the heavy hot-rolled products, concessions from the 1.80c., Pittsburgh, minimum are still made on unusually attractive business.

The pig iron market is without feature, and shipments are still curtailed on account of the light requirements of certain large users of basic. Scrap is also quiet, following a week of

some activity in the lighter grades, and no purchases by mills are reported.

**Pig Iron.**—Business is still very quiet, and shipments are holding at the average for recent weeks. However, one or two producers moved more iron in the first two weeks of April than during the corresponding March period. Large shippers of basic iron are probably not so fortunate. No new inquiry is before the trade, and smaller buyers are covering their needs from week to week, in most cases demanding immediate shipments.

Prices are quotably unchanged, but the tone of the market is weak, and in some cases consumers are adverse to seeing the present pig iron quotations maintained, in view of the sharp declines in steel prices over the last few months. A few large buyers, who have sliding scale contracts, are able to take advantage of these lower steel prices in their purchases of basic iron, and this does not help the general market situation. On basic and foundry iron, the prevailing quotation on small lots is \$18.50, Valley, with \$19 asked for Bessemer and malleable. The Pittsburgh merchant furnace is quoting prices 50c. a ton higher.

Prices per gross ton, f.o.b. Valley furnace:

Basic	\$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	\$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

**Semi-Finished Steel.**—Shipments have been slightly heavier in the last week or two, but new buying is very light, and the \$33, Pittsburgh or Youngstown, quotation on billets, slabs and sheet bars is strictly nominal. It is generally admitted that not all large buyers are paying this much for their crude steel, but such concerns are as usual covering their

**Steel tonnage in first half of April slightly better than in corresponding March period.**

\* \* \*

**Demand for steel has not expanded sufficiently to strengthen prices.**

\* \* \*

**Pig iron market weak, though prices are unchanged.**

\* \* \*

**Scrap acting listlessly, with continued weakness in prices of some grades. Heavy melting steel unchanged.**

\* \* \*

**Contract awarded for 11,430 tons of structural steel for Pittsburgh building.**

needs quietly from their regular sources of supply.

Shipments of forging billets show little change, but recent sales have brought the full quotation of \$38, Pittsburgh. Wire rods are moving in fair volume to the bolt and nut makers, and the \$38 price is holding on the general run of business.

**Bolts, Nuts and Rivets.**—Slight improvement in the automobile industry and widening activity in the structural steel market have stimulated demand for bolts, nuts and rivets since the beginning of the month, and plants in this district are running at about 60 per cent of capacity. Mill discounts are holding to the jobbing trade, but there has been shading in the secondary market, which has had an unfavorable effect on the business in general. Price uncertainty in the market for raw material used by bolt and nut makers has also caused them some embarrassment, as consumers are quick to demand lower prices as a result of reduced quotations for wire and rods.

Mill prices on bolts and nuts are holding at 70 per cent off list, while large rivets are still quotable at \$3.10, Pittsburgh or Cleveland.

**Bars, Shapes and Plates.**—Aggregate specifications for the heavy hot-rolled products show no marked change, although a slightly stronger demand for soft steel bars and reinforcing bars is developing. Structural steel is also moving to the smaller fabricating shops in the district at a better rate, as these concerns are benefiting by more numerous small orders, which reflect a mild seasonal upturn in building operations. The larger fabricating shops are well engaged, and have considerable work on their books. Demand for plates is only fair, as the railroad car builders are specifying in a more or less restricted way, and other consuming lines are no more active than they have been.

The leading interest has announced a change in sketch extras on plates. Heretofore, these extras were figured on a scrap loss basis, and under the new card a net per cent extra will apply for both regular and irregular sketches. This extra will amount to 50c. a 100 lb. on irregular sketches, and 20c. a 100 lb. on regular. The new card also establishes 3 ft. as the minimum before cutting extras are to be applied, as opposed to a 5-ft. minimum in the past. Other makers had previously used a 3-ft. base for cutting extras. Other makers of plates are expected to follow the change in applying sketch extras.

Bar prices are unchanged at 1.80c. to 1.85c., Pittsburgh, with the higher quotation applying only on carload lots. The ruling price on plates and shapes in this district is 1.80c., although mixed carloads and very small lots are occasionally bringing \$1 more.

**Tubular Goods.**—The pipe market is quiet this week so far as large projects are concerned, and it is reported that the gasoline carrying lines for both the Barnsdall Corporation and the Sun Oil Co., are to be delayed for a time. On the other hand, the Doherty interests are working on the large gas line which they expect to build from the Oklahoma fields to Chicago, but it will be several weeks before the details will be ironed out to the point where the order can be placed. No new inquiries

## THE IRON AGE Composite Prices

### Finished Steel

April 15, 1930, 2.264c. a Lb.

One week ago	2.264c.
One month ago	2.312c.
One year ago	2.412c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1930	2.362c., Jan. 7;	2.264c., April 1
1929	2.412c., April 2;	2.362c., Oct. 29
1928	2.391c., Dec. 11;	2.314c., Jan. 3
1927	2.453c., Jan. 4;	2.293c., Oct. 25
1926	2.453c., Jan. 5;	2.403c., May 18
1925	2.560c., Jan. 6;	2.396c., Aug. 18

### Pig Iron

April 15, 1930, \$17.75 a Gross Ton

One week ago	\$17.75
One month ago	17.75
One year ago	18.46

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1930	\$18.21, Jan. 7;	\$17.75, March 4
1929	18.71, May 14;	18.21, Dec. 17
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1
1926	21.54, Jan. 5;	19.46, July 13
1925	22.50, Jan. 13;	18.96, July 7



# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars

Soft Steel	
Base per Lb.	
F.o.b. Pittsburgh mill.....	1.80c. to 1.85c.
F.o.b. Chicago.....	1.90c. to 2.00c.
Del'd Philadelphia.....	2.12c. to 2.17c.
Del'd New York.....	2.14c. to 2.19c.
F.o.b. Cleveland.....	1.80c.
F.o.b. Lackawanna.....	1.90c. to 1.95c.
F.o.b. Birmingham.....	2.00c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c.

Billet Steel Reinforcing	
F.o.b. Pittsburgh mills, 40, 50, 60-ft.....	1.85c.
F.o.b. Pittsburgh mills, cut lengths.....	2.20c.
F.o.b. Birmingham, mill lengths.....	2.00c.

Rail Steel	
F.o.b. mills, east of Chicago dist.....	1.80c. to 1.90c.
F.o.b. Chicago Heights mill.....	1.80c.
Del'd Philadelphia.....	2.12c. to 2.22c.

Iron	
Common iron, f.o.b. Chicago.....	1.90c. to 2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

## Tank Plates

Base per Lb.	
F.o.b. Pittsburgh mill.....	1.80c. to 1.85c.
F.o.b. Chicago.....	1.90c. to 2.00c.
F.o.b. Birmingham.....	2.00c.
Del'd Cleveland.....	1.95c.
Del'd Philadelphia.....	1.95c. to 2.00c.
F.o.b. Coatesville.....	1.85c. to 1.90c.
F.o.b. Sparrows Point.....	1.90c. to 1.95c.
F.o.b. Lackawanna.....	1.90c. to 1.95c.
Del'd New York.....	2.02½c. to 2.07½c.
C.i.f. Pacific ports.....	2.20c.

## Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh mill.....	1.80c. to 1.85c.
F.o.b. Chicago.....	1.90c. to 2.00c.
F.o.b. Birmingham.....	2.00c.
F.o.b. Lackawanna.....	1.90c. to 1.95c.
F.o.b. Bethlehem.....	1.90c. to 1.95c.
Del'd Cleveland.....	1.99c.
Del'd Philadelphia.....	1.81c. to 1.86c.
Del'd New York.....	1.94½c. to 2.04½c.
C.i.f. Pacific Ports.....	2.35c.

## Hot-Rolled Hoops, Bands and Strips

Base per Lb.	
6 in. and narrower, P'gh.....	1.80c. to 1.90c.
Wider than 6 in., P'gh.....	1.70c. to 1.80c.
6 in. and narrower, Chicago.....	1.95c. to 2.00c.
Wider than 6 in., Chicago.....	1.85c. to 1.90c.
Cooperage stock, P'gh.....	2.10c. to 2.20c.
Cooperage stock, Chicago.....	2.30c.

## Cold-Finished Steel

Base per Lb.	
Bars, f.o.b. Pittsburgh mill.....	2.10c.
Bars, f.o.b. Chicago.....	2.10c.
Bars, Cleveland.....	2.10c.
Bars, Buffalo.....	2.10c.
Shafting, ground, f.o.b. mill.....	2.45c. to 3.40c.
Strips, P'gh.....	2.55c. to 2.65c.
Strips, Cleveland.....	2.55c. to 2.65c.
Strips, del'd Chicago.....	2.85c. to 2.95c.
Strips, Worcester.....	2.80c. to 2.90c.
Fender stock, No. 20 gage, Pitts- burgh or Cleveland.....	3.90c.

\*According to size.

## Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)  
To Merchant Trade

Base per Keg	
Standard wire nails.....	\$2.15 to \$2.30
Cement coated nails.....	2.30
Galvanized nails.....	4.30

Base per Lb.	
Polished staples.....	2.75c.
Galvanized staples.....	3.00c.
Barbed wire, galvanized.....	2.95c.
Annealed fence wire.....	2.45c.
Galvanized wire, No. 9.....	2.90c.
Woven wire fence (per net ton to re- tailers).....	\$65.00

To Manufacturing Trade

Bright hard wire, Nos. 6 to 9 gage.....	2.40c.
Spring wire.....	3.50c.

(Carload lots, f.o.b. Chicago)  
Wire nails.....\$2.25 to \$2.45 (keg)  
Annealed fence wire.....2.50c. to 2.60c. (lb.)  
Bright hard wire to manufacturing trade.....2.45c.  
Anderson, Ind., mill prices are ordinarily  
\$1 a ton over Pittsburgh base; Duluth,  
Minn., mill \$2 a ton over Pittsburgh, and  
Birmingham mill \$3 a ton over Pittsburgh.

## Cut Nails

Per 100 Lb.	
Carloads, Wheeling, Reading or Northumberland, Pa.....	\$2.55 to \$2.60
Less carloads, Wheeling or Reading	2.70

## Light Plates

No. 10, blue annealed, f.o.b. P'gh.....	2.10c.
No. 10, blue annealed, f.o.b. Chicago dist.....	2.20c.
No. 10, blue annealed, del'd Phila.....	2.42c.
No. 10, blue annealed, B'ham.....	2.25c.

## Sheets

### Blue Annealed

Base per Lb.	
No. 13, f.o.b. P'gh.....	2.25c.
No. 13, f.o.b. Chicago dist.....	2.35c.
No. 13, del'd Philadelphia.....	2.57c.
No. 13, blue annealed, B'ham.....	2.45c.

Continuous Mill Sheets	
No. 10 gage, f.o.b. P'gh.....	1.90c.
No. 13 gage, f.o.b. P'gh.....	2.05c.

(Usual range 24 in. to 48 in. wide)

Box Annealed, One Pass Cold Rolled	
No. 24, f.o.b. Pittsburgh.....	2.55c. to 2.65c.
No. 24, f.o.b. Chicago dist. mill.....	2.65c. to 2.75c.
No. 24, del'd Philadelphia.....	2.97c.
No. 24, f.o.b. Birmingham.....	2.90c.

Steel Furniture Sheets	
No. 24, f.o.b. P'gh.....	3.90c.

Galvanized	
No. 24, f.o.b. Pittsburgh.....	3.30c.
No. 24, f.o.b. Chicago dist. mill.....	3.40c.
No. 24, del'd Cleveland.....	3.49c.
No. 24, del'd Philadelphia.....	3.62c.
No. 24, f.o.b. Birmingham.....	3.45c.

Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh.....	2.80c. to 2.90c.
No. 28, f.o.b. Chicago dist. mill.....	3.00c. to 3.10c.

Automobile Body Sheets	
No. 20, f.o.b. Pittsburgh.....	3.80c.

Long Ternes	
No. 24, 8-lb. coating, f.o.b. mill.....	3.90c. to 4.00c.
Vitreous Enameling Stock	
No. 24, f.o.b. Pittsburgh.....	3.90c.

## Tin Plate

Per Base Box	
Standard cokes, f.o.b. P'gh district mills.....	\$5.25
Standard cokes, f.o.b. Gary.....	5.35

## Terne Plate

(F.o.b. Morgantown or Pittsburgh)  
(Per Package, 20 x 28 in.)

8-lb. coating I.C.\$10.70	25-lb. coating I.C.\$15.90
15-lb. coating I.C. 13.40	30-lb. coating I.C. 16.80
20-lb. coating I.C. 14.60	40-lb. coating I.C. 18.80

## Alloy Steel Bars

(F.o.b. makers' mill)  
Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series	Alloy	Differential
2000 (½% Nickel)	.....	\$0.25
2100 (1¼% Nickel)	.....	0.55
2300 (3½% Nickel)	.....	1.50
2500 (5% Nickel)	.....	2.25
3100 Nickel Chromium	.....	0.55
3200 Nickel Chromium	.....	1.35
3300 Nickel Chromium	.....	3.80
3400 Nickel Chromium	.....	3.20
4100 Chromium Molybdenum (0.15 to	0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to	0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30	Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90	Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10	Chromium)	0.45
5100 Chromium Spring Steel.....	.....	0.20
6100 Chromium Vanadium Bars.....	.....	1.20
6100 Chromium Vanadium Spring Steel	.....	0.95
9250 Silicon Manganese Spring Steel	(flats)	0.25
Rounds and squares.....	.....	0.50
Chromium Nickel Vanadium.....	.....	1.50
Carbon Vanadium.....	.....	0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

## Rails

Per Gross Ton	
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Chgo mill.....	36.00

## Track Equipment

Base per 100 Lb.	
Spikes, ½ in. and larger.....	\$2.80
Spikes, ¼ in. and smaller.....	2.80
Spikes, boat and barge.....	3.00
Tie plate, steel.....	2.07½

Angle bars.....	\$2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	70 per cent off list

## Welded Pipe

Base Discounts, f.o.b. Pittsburgh District  
and Lorain, Ohio, Mills

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
1/8	47	21 1/2	1/8 and 3/16	+11	+36
1/8 to 3/16	53	27 1/2	1/8	23	5
1/8	58	44 1/2	3/16	28	11
3/16	62	50 1/2	1 and 1 1/4	31	15
1 to 3	64	52 1/2	1 1/2 and 2	35	18

Lap Weld			
Steel		Iron	
Inches	Black Galv.	Inches	Black Galv.
2.....	57	45½	12..... 28 9
2½ to 6.....	61	49½	2½ to 3½..... 28 13
7 and 8.....	58	46½	4 to 6..... 30 17
9 and 10.....	56	43½	7 and 8..... 29 16
11 and 12.....	55	42½	9 to 12..... 26 11

Butt Weld, extra strong, plain ends					
1½ .....	43	26½	1½ and ¾ +13	+48	
1½ to ¾.....	49	32½	1½ .....	23	7
1½ .....	55	44½	¾ .....	28	12
¾ .....	60	49½	1 to 2....	34	18
1 to 1½.....	62	51½			
2 to 3.....	63	52½			

Lap Weld, extra strong, plain ends					
2 .....	55	44½	2 .....	29	13
2½ to 4 .....	59	48½	2½ to 4 .....	34	20
4½ to 6 .....	58	47½	4½ to 6 .....	33	19
7 to 8 .....	54	41½	7 and 8 .....	31	17
9 and 10 .....	47	34½	9 to 12 .....	21	8
11 and 12 .....	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

## Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel	Charcoal Iron
2 in. and 2½ in.....	38
2½ in.—2¾ in.....	46
3 in.....	52
3½ in.—3¾ in.....	54
4 in.....	57
4½ in. to 6 in.....	46
1½ in.....	38
1¾ in.....	46
2 in.....	52
2½ in.....	54
3 in.....	57
3½ in.....	54
4 in.....	57
4½ in.....	54
5 in.....	57
5½ in.....	54
6 in.....	57

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts: Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn	
1 in.....	61
1½ to 1¾ in.....	53
1¾ in.....	37
2 to 2½ in.....	32
2½ to 2¾ in.....	40
3 in.....	52
3½ in.....	54
4 in.....	57
4½, 5 and 6 in.....	46

Hot Rolled	
2 and 2½ in.....	38
2½ and 2¾ in.....	46
3 in.....	52
3½ to 3¾ in.....	54
4 in.....	57
4½, 5 and 6 in.....	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

Per Cent Off List	
Carbon, 0.10% to 0.30% base (carloads).....	55
Carbon, 0.30% to 0.40% base.....	50
Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

of importance are reported, but a number of lines are in prospect.

Standard butt-weld pipe for the building industry is moving slightly better, but any increase reported must be recorded as seasonal, and, with that factor discounted, aggregate tonnage is very light. Oil country goods are in moderate demand, but conditions in that industry are improving, and a better movement is expected in the latter part of the year. Mechanical tubing is slightly more active.

**Wire Products.**—Unsatisfactory conditions in the nail market have influenced the wire situation unfavorably in the last week or two, but the price of manufacturers' wire is still holding on the general run of business, with few concessions from 2.40c., Pittsburgh, reported. Demand for manufacturers' wire is holding up rather well, but merchant wire products are still quiet.

Nail prices are still seeking a quotable level, although developments in the last two or three days indicate that a definite minimum price may be established in the near future. Sales in the immediate Pittsburgh district at less than \$2.20 a keg are exceptional, but in other territories sharp concessions from this figure have been made. At Atlantic seaboard points, imported nails have been a factor in the market situation, and domestic producers have made extremely low prices on certain occasions to meet this competition.

**Sheets.**—Demand for sheet steel products is holding at the level of recent weeks, with slight improvement reported from certain companies which supply the large automobile makers. Metal lath makers are also ordering out considerable material, but Pittsburgh mills find makers of other sheet steel building products apathetic. In the South and Southwest galvanized sheets and roofing are in better demand, but prices are low in this territory, and such business is not considered desirable. Sheet operations in the Pittsburgh and Valley areas average 70 per cent, and are slightly better with a few companies.

Prices have not gained strength during the week, but are not quotably lower.

**Tin Plate.**—Specifications have been rather light in the last few days, but a slight uncertainty at this time is not unexpected. It is too early for canning companies to get any line on crop acreages, and container manufacturers, with shipments temporarily lessened, are unable to take any added material. Nevertheless, mill operations in the district still average 85 to 90 per cent, with at least two makers running extra turns to accommodate demand.

**Strip Steel.**—Specifications for hot-rolled strip in the first half of April averaged about 10 per cent heavier than in the corresponding March period and operations in the industry

show a corresponding increase. Most of the added business is coming from the automobile industry and then from three or four makers. Hardware manufacturers are doing little and other consumers of strip, while taking steel steadily, are not accounting for much volume. Demand for cold-rolled strip continues to lag, but is equally poor with all producers and is not longer regarded with much concern. Leading makers look for a considerable decline in the year as a whole which may not be offset over a long period.

Strip prices have apparently reached bottom and no irregularities from 1.70c., Pittsburgh, on material 6 in. and wider, and 1.80c. on the narrower widths, are reported. Prices \$2 a ton higher still apply on small lots. On cold-rolled strip 2.55c., Pittsburgh, is holding.

**Cold-Finished Steel, Bars and Shafting.**—Improvement is very slow, but specifications seem to be gaining gradually and a comparison of tonnage releases for the month to date with the corresponding March period shows a comfortable gain with nearly all makers. It is pointed out by some that this expansion in demand is by no means attributable in any large degree to the automobile industry. The farm implement makers are still a large outlet and builders of road-building machinery are very active. Manufacturers of machine tools and general machinery are also taking bars and shafting at a fair rate.

The price is holding at 2.10c., Pittsburgh, for cold-finished bars.

**Coal and Coke.**—The market on furnace coke is very weak, and al-

though still quotable at \$2.60, Connellsville, concessions are not uncommon on spot business. Production is being curtailed, but is not yet in line with demand. Foundry coke is quiet, with shipments light.

Activity persists in the coal market, as several large buyers of gas coal have not yet covered their second quarter requirements. The slack market also continues active, with steam slack bringing \$1 and \$1.10 and gas slack as high as \$1.25. The present shortage is expected to be adjusted in two or three weeks.

**Old Material.**—Following slight activity in the lighter grades last week, the scrap market is again in a listless condition, with most prices nominal and additional weakness in some grades. With mill purchases of No. 1 heavy melting steel entirely lacking, the price is unchanged at \$15.75 to \$16.25, and it is reported that brokers are occasionally able to buy this grade against old contracts at as low as \$15.50.

Hydraulic compressed sheets are still rather strong, a recent list of a large Detroit automobile body builder having brought \$15.85, delivered Pittsburgh. Machine shop turnings are quiet and quotably weaker, even though one mill in the district is said to be willing to pay \$11.50.

With little buying by brokers, material can be picked up at rather low prices, and the market is quotable this week at \$10.75 to \$11.25. Specialties are also off 50c. and most other price tendencies seem to be downward. Good scrap continues rather scarce, although a distress tonnage of No. 1 heavy melting steel was offered to several local mills last week at \$16.10.

*Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:*

#### Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates .....	3.00c.
Structural shapes .....	3.00c.
Soft steel bars and small shapes...	2.90c.
Reinforcing steel bars.....	2.90c.
Cold-finished and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats .....	4.10c.
Bands .....	3.25c.
Hoops .....	4.25c.
Black sheets (No. 24), 25 or more bundles .....	3.60c.
Galv. sheets (No. 24), 25 or more bundles .....	4.25c.
Light plates, blue annealed (No. 10), 1 to 24 plates .....	3.20c.
Blue annealed sheets (No. 13)....	3.25c.
Galv. corrug. sheets (No. 28), per square .....	4.13c.
Spikes, large .....	3.40c.
Small .....	3.80c. to 5.25c.
Boat .....	3.80c.
Track bolts, all sizes, per 100 count, 60 per cent off list	
Machine bolts, 100 count, 60 per cent off list	
Carriage bolts, 100 count, 60 per cent off list	
Nuts, all styles, 100 count, 60 per cent off list	
Large rivets, base per 100 lb. \$3.50	
Wire, black, soft ann'l'd, base per 100 lb.....	\$2.75 to 2.85
Wire, galv. soft, base per 100 lb. ....	3.20 to 3.30
Common wire nails, per keg. 2.60 to 2.75	
Cement coated nails, per keg 2.65 to 2.80	

\*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies on orders of 400 to 3999 lb.

#### Basic Open-Hearth Grades:

No. 1 heavy melting steel..	\$15.75 to \$16.25
No. 2 heavy melting steel..	13.75 to 14.25
Scrap rails .....	15.00 to 15.50
Compressed sheet steel....	15.75 to 16.00
Bundled sheets, sides and ends .....	14.00 to 14.50
Cast iron carwheels.....	14.50 to 15.00
Sheet bar crops, ordinary..	17.50 to 18.00
Heavy breakable cast.....	11.50 to 12.00
No. 2 railroad wrought....	15.75 to 16.25
Hvy. steel axle turnings...	14.00 to 14.50
Machine shop turnings....	10.75 to 11.25

#### Acid Open-Hearth Grades:

Railr. knuckles and couplers	19.50 to 20.00
Railr. coil and leaf springs	19.50 to 20.00
Rolled steel wheels.....	19.50 to 20.00
Low phos. billet and bloom ends .....	21.50 to 22.50
Low phos. mill plates....	20.50 to 21.50
Low phos. light grades....	20.50 to 21.50
Low phos. sheet bar crops..	21.00 to 22.00
Heavy steel axle turnings..	14.00 to 14.50

#### Electric Furnace Grades:

Low phos. punchings....	19.50 to 20.00
Hvy. steel axle turnings..	14.00 to 14.50

#### Blast Furnace Grades:

Short shoveling steel turnings .....	10.50 to 11.00
Short mixed borings and turnings .....	10.50 to 11.00
Cast iron borings .....	10.50 to 11.00

#### Rolling Mill Grades:

Steel car axles.....	21.50 to 22.00
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#### Cupola Grades:

No. 1 cast .....	14.00 to 15.00
Rails 3 ft. and under....	18.50 to 19.50



# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Mill Prices of Semi-Finished Steel

Billets and Blooms		Sheet Bars		Skelp	
Per Gross Ton		(Open Hearth or Bessemer)		(F.o.b. Pittsburgh or Youngstown)	
Re-rolling, 4-in. and under 10-in. Pitts-		Pittsburgh	Per Gross Ton	Grooved	Per Lb.
burgh	\$33.00	Youngstown	\$33.00	Universal	1.85c. to 1.90c.
Re-rolling, 4-in. and under 10-in. Youngs-		Cleveland	\$33.00	Sheared	1.85c. to 1.90c.
town	33.00				
Re-rolling, 4-in. and under 10-in., Cleveland	33.00	Slabs		Wire Rods	
Re-rolling, 4-in. and under 10-in., Chicago.	34.00	(8 in. x 2 in. and under 10 in. x 10 in.)		(Common soft, base)	
Forging quality, Pittsburgh.	38.00	Pittsburgh	Per Gross Ton	Pittsburgh	Per Gross Ton
		Youngstown	\$33.00	Cleveland	\$33.00
		Cleveland	\$33.00	Chicago	\$33.00

## Prices of Raw Material

Ores		Ferromanganese		Fluxes and Refractories	
Lake Superior Ores, Delivered Lower Lake Ports		Per Gross Ton		Fluorspar	
Old range Bessemer, 51.50% iron	\$4.80	Domestic, 80%, seaboard	\$94.00 to \$99.00	Per Net Ton	
Old range non-Bessemer, 51.50% iron	4.65	Foreign, 80%, Atlantic or Gulf port, duty paid	94.00 to 99.00	Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	\$18.00
Mesabi Bessemer, 51.50% iron	4.65	Spiegeleisen		No. 2 lump, Illinois and Kentucky mines	20.00
Mesabi non-Bessemer, 51.50% iron	4.50	Per Gross Ton Furnace		Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	\$18.00 to 18.50
High phosphorus, 51.50% iron	4.40	Domestic, 19 to 21%	\$31.00 to \$34.00	Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silica, f.o.b. Illinois and Kentucky mines	32.50
Foreign Ore, c.i.f. Philadelphia or Baltimore		Domestic, 16 to 19%	29.00 to 32.00	Fire Clay Brick	
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	12.00c.	Electric Ferrosilicon		Per 1000 f.o.b. Works	
Iron ore, low phos., Swedish, average 68% iron	12.00c.	Per Gross Ton Delivered		High-Heat Intermediate Duty Brick	
Iron ore, basic Swedish, average 65% iron	10.00c.	50%	\$83.50	Pennsylvania	\$43.00 to \$46.00
Manganese ore, washed 52% manganese, from the Caucasus	30.00c.	75%	130.00	Maryland	48.00 to 46.00
Manganese ore, Brazilian, African or Indian, basic 50%	30.00c.	Per Gross Ton Furnace		New Jersey	50.00 to 65.00
Tungsten ore, high grade, per unit, in 60% concentrates	\$14.50 to \$15.50	10%	\$35.00	Ohio	43.00 to 46.00
Chrome ore, 45 to 50% Cr <sub>2</sub> O <sub>3</sub> , crude, c.i.f. Atlantic seaboard	\$22.00 to \$24.00	11%	37.00	Kentucky	43.00 to 46.00
Molybdenum ore, 85% concentrates of MoS <sub>2</sub> , delivered	50c. to 55c.	Bessemer Ferrosilicon		Missouri	43.00 to 46.00
Coke		F.o.b. Jackson County, Ohio, Furnace		Illinois	43.00 to 46.00
Per Net Ton		Per Gross Ton		Ground fire clay, per ton	7.00
Furnace f.o.b. Connellsville prompt	\$2.60	10%	\$30.00	Silica Brick	
Foundry, f.o.b. Connellsville prompt	\$3.50 to 4.75	11%	32.00	Per 1000 f.o.b. Works	
Foundry, by-product, Ch'go ovens	8.00	Silvery Iron		Pennsylvania	\$43.00
Foundry, by-product, New England, del'd	11.00	F.o.b. Jackson County, Ohio, Furnace		Chicago	\$43.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40	6%	\$22.00 to \$23.00	Birmingham	50.00
Foundry, by-product, Phila.	9.00	7%	23.00 to 24.00	Silica clay, per ton	\$8.50 to 10.00
Foundry, Birmingham	5.00	8%	24.00 to 25.00	Magnesite Brick	
Foundry, by-product, St. Louis, f.o.b. ovens	8.00	9%	25.00 to 26.00	Per Net Ton	
Foundry by-prod., del'd St. Louis	9.00	Other Ferroalloys		Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00
Coal		Ferrotungsten, per lb. contained metal del'd	\$1.40 to \$1.50	Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Per Net Ton		Ferrocromium, 4 to 6% carbon and up to 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	\$1.00c.	Standard size	45.00
Mine run steam coal, f.o.b. W. Pa. mines	\$1.25 to \$1.75	Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65	Chrome Brick	
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75	Ferrocobalt, 15 to 18%, per net ton, f.o.b. furnace, in carloads	\$160.00	Per Net Ton	
Gas coal, 3/4-in. f.o.b. Pa. mines	1.90 to 2.00	Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	\$91.00	Standard size	\$45.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75	Ferrophosphorus, electric 24%, f.o.b. Aniston, Ala., per gross ton	\$122.50		
Steam slack, f.o.b. W. Pa. mines	90c. to 1.10				
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.25				

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts		Bolts and Nuts		Small Rivets	
Per 100 Pieces		Per Cent Off List		(7/16-in. and smaller)	
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)		Semi-finished hexagon nuts		Per Cent Off List	
Machine bolts	70	Semi-finished hexagon castellated nuts, S.A.E.	70	F.o.b. Pittsburgh	70 and 10
Carriage bolts	70	Stove bolts in packages, P'gh	75, 20, 10 and 5	F.o.b. Cleveland	70 and 10
Lag bolts	70	Stove bolts in packages, Chicago	75, 20, 10 and 5	F.o.b. Chicago	70 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads	70	Stove bolts in packages, Cleveland	75, 20, 10 and 5	Cap and Set Screws	
Hot-pressed nuts, blank or tapped, square	70	Stove bolts in bulk, P'gh	75, 20, 10, 5 and 2 1/2	(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	
Hot-pressed nuts, blank or tapped, hexagons	70	Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2 1/2	Per Cent Off List	
C.p.c. and t. square or hex. nuts, blank or tapped	70	Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2 1/2	Milled cap screws	80, 10 and 5
Washers*	7.00c. to 6.75c. per lb. off list	Tire bolts	60, 5 and 5	Milled standard set screws, case hardened	80 and 5
*F.o.b. Chicago, New York and Pittsburgh.		Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.		Milled headless set screws, cut thread	75 and 10
†Bolts with rolled thread up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.		Large Rivets		Upset hex. head cap screws, U.S.S. thread	85 and 10
		(1/2-in. and larger)		Upset hex. cap screws, S.A.E. thread	85 and 10
		Base per 100 Lb.		Upset set screws	80, 10 and 5
		F.o.b. Pittsburgh or Cleveland	\$3.10	Milled studs	70
		F.o.b. Chicago	\$3.20		

# CHICAGO: New Steel Tonnage Equaling Shipments —Operations at 95 Per Cent of Capacity

CHICAGO, April 15.—The steel market in the Middle West appears to have hit a steady stride both as to price structure and as to tonnages moving to consumers. Open-hearth employment is fully equal to the rate a week ago, when 95 per cent of capacity was active. Temporarily there is another steel mill blast furnace in use. The Illinois Steel Co. lighted No. 5 stack at South Works last Saturday and it will take No. 1 furnace out for relining at the end of this week. This change actually represents a gain in steel mill pig iron output for the reason that the furnace coming in is of larger capacity than the one going out.

Specifications for finished steel products, though lighter than a week ago, are still equal to shipments. New sales stand near the average so far this year and, on the whole, are considered satisfactory in view of the large volume of purchases made in the first week in April.

The relative uniformity in volume of releases from week to week is favoring more advantageous rolling schedules. Users, on the other hand, are being forced to anticipate a little further ahead. Average deliveries on plates now range from four to six weeks, shapes may be had in three to five weeks and bars can be shipped in three to six weeks. Specifications to bar mills in March were 18 per cent larger than in February, after accounting for the extra days in the third month. Releases already made for April indicate that shipments in this month will show a comfortable gain over the tonnage of the previous month. The Illinois Central is asking for prices on 20 suburban cars and will take bids near the end of the week on the remainder of its rolling stock requirements, as recently announced.

**Pig Iron.**—April shipments of Northern foundry iron are running fully 15 per cent heavier than the rate in March, and releases now in the hands of sellers indicate that this gain will be well maintained throughout the remainder of the month. With one merchant stack out for relining, producers find that shipments are larger than production and, accordingly, inventories at local stacks are shrinking. Prices in the local market are steady at \$19.50 a ton. However, it is said that competition with Southern iron in Michigan has brought out irregular quotations. Prices for silvery are weak and new sales are light. The markets for charcoal and Southern iron are quiet.

## Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil.	1.75 to 2.25	\$19.50
N'th'n No. 1 fdy., sil.	2.25 to 2.75	20.00
Malleable, not over 2.25 sil.		19.50
High phosphorus		19.50
Lake Super. char'cl, sil.	1.50	27.04
S'th'n No. 2 fdy.		\$18.20 to 19.01
Low phos., sil. 1 to 2, copper free.		29.50
Silvery, sil. 8 per cent.		\$28.79 to 29.79
Bess. ferrosilicon, 14-15 per cent.		46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

**Sheets.**—Demand for sheets remains at the uniform rate of recent weeks. Consumers' needs can be taken care of promptly by producers, and there

seems to be no disposition on the part of users to order except for nearby consumption. Hot mill backlogs are almost negligible, and schedules are being arranged only a few days in advance. Less uncertainty surrounds quotations for black sheets, which are gaining strength.

**Base prices per lb., deliv'd from mill in Chicago:** No. 24 black sheets, 2.70c. to 2.80c.; No. 24 galv., 3.45c.; No. 10 blue ann'l'd, 2.25c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

**Semi-Finished Steel.**—Demand is broadening, and buyers are seeking prompt deliveries.

**Rails and Track Supplies.**—Miscellaneous orders of standard-section rails, in lots of 500 to 1000 tons each, aggregate 5000 tons. Included in this business are the requirements of one frog and switch manufacturer and several small railroads and electric traction companies operating in the West. Specifications for track supplies are large and new business aggregates 2500 tons. Western rail mills are operating at near capacity.

## Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel—	
Under 5 tons	2.85c.
5 tons to 30 tons	2.45c.
30 tons and over	2.00c.
Rail steel reinforcement	1.75c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands (3/4 in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.60c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, 3/4 in. and larger	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

## Per Cent Off List

Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	\$3.45
Com. wire nails, base per keg	\$2.85 to 2.95
Cement c'd nails, base per keg	2.85 to 2.95

It has been reported that mills have received a number of suspensions on rail shipments. Local producers explain these reports by the fact that some shipments have been deferred, thus relieving stress at rail mills. The thought is expressed that these tonnages will be rolled and thereby will serve to spread the rolling program later into the summer months. Satisfactory schedules are now arranged into the first part of July. A cargo of rails is due to arrive at Duluth in a week or 10 days.

**Prices f.o.b. mill, per gross ton:** Standard section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. **Per lb.:** Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07 1/2c. to 2.15c.; angle bars, 2.75c.

**Cast Iron Pipe.**—The general characteristics of this market remain unchanged, with current inquiries and new business at satisfactory levels. Prices for pipe 6-in. and larger are still quotable at \$37 to \$38 a ton, Birmingham, but lower prices are being named where foreign made pipe is a factor.

Two Rivers, Wis., has placed 100 tons of 6 and 8-in. Class C pipe with the Traverse City (Mich.) Iron Works, and the McWane Cast Iron Pipe Co. will supply 150 tons of 4 and 6-in. pipe to Gordon, Neb. Akron, Ohio, has ordered 1500 tons of 4 to 16-in. pipe, 650 tons of the 16-in. size having been taken by James B. Clow & Sons. Among awards to unnamed bidders are 15,000 ft. of 6 and 12-in. pipe by Grosse Pointe, Mich., and about 13,000 ft. of 6 and 8-in. pipe by Whitefish Bay, Wis. A general contract has been let by Toledo, Ohio, for a sewage disposal plant, for which will be required 500 tons of cast iron pipe.

Among inquiries are 200 tons for a sewage disposal plant at Moraine City, Ohio, and four miles of 4 to 10-in. pipe for Dayton, Ohio.

**Prices per net ton, deliv'd Chicago:** Water pipe, 6-in. and over, \$45.20 to \$46.20; 4-in., \$48.20 to \$49.20; Class A and gas pipe, \$3 extra.

**Wire Products.**—Irregularities in prices of common wire nails have continued to spread in spite of efforts by some sellers to hold at the quotations of a week ago. Demand for this commodity is seasonably light, and it is a question whether low quotations will have a stimulating effect upon shipments. Prices as low as \$2.25 a keg in carloads at Chicago have been named, and it is reported that lower offers have been quoted in the central Mississippi River Valley.

Buyers are showing extreme caution in naming tonnages desired and in seeking out the best prices obtainable. Encouraging to the trade is the fact that jobbers' contracts are being made



more freely. Specifications from this source are growing slowly under the influence of warm and comparatively dry weather. Woven wire fencing continues to move in good volume in spite of the lateness of the season.

Output at wire mills ranges from 50 to 55 per cent of capacity, or 10 to 15 points below the rate of a year ago.

**Cold-Rolled Strip.**—Individual specifications are usually small, and consumers are demanding prompt shipment. Prices are steady in this territory.

**Reinforcing Bars.**—Local bending shops are experiencing extreme pressure for deliveries. Contractors who are accustomed to have much work at this time of the year are anxious to get out of the way the few contracts they now have in the hope that more important work will soon break. Shops have lengthened hours of operation, but the rate is still far below that usually expected in the spring. Some Illinois County bridge work has been placed, and neighboring States are buying for road programs. Illinois has awarded general contracts which call for 1400 tons of concrete highway reinforcement. An encouraging feature of the market is the fact that most dealers here are now publishing prices and this is expected by the trade to add stability to the market.

**Plates.**—The Chicago plate market remains active and strong, as indicated by deliveries, which now range from four to six weeks on most sizes. Shipments for pipe manufacture are heavy, and the needs of car builders are still impressive, specifications from the latter source having totaled about 5000 tons. The A. O. Smith Corporation, Milwaukee, has taken an order for 275 tons for two pressure tanks, which will be delivered to the Atmospheric Nitrogen Co., Hopewell, Va.

A Western mill has booked 700 tons of plates for oil storage tanks, which will be erected in the Southwest, and fresh inquiry of like kind is for 1000 tons. The tonnage pending for oil storage purposes is large.

The railroad equipment market is quiet. Orders are reported for 14 dump cars and 100 tank cars.

**Structural Material.**—This has been another satisfactory week in demand and in growth of interest in structural material. Awards total 4500 tons, and fresh inquiries aggregate over 9000 tons, of which 7000 tons is for a power house structure at Kansas City, Mo. Requests for prices for small tonnages are numerous. In fact, the whole situation in this market is measurably better than at the beginning of the month. Noteworthy among projects are plans of utility companies, which are now asking for steel for central stations and transmission towers for many points in the Central West.

Prices at 1.90c. to 2c. are lacking in strength; in fact, the higher quotation has almost disappeared.

**Bars.**—Soft steel bar mill operations are a shade below 95 per cent of capacity. Current specifications are close to the average so far this year, but new sales are light, following several weeks of heavy commitments. March specifications ran well above the total in February, and April promises betterment over the March rate.

The alloy bar market is steady both as to prices and shipments. The iron

**Steel operations hold to 95 per cent rate.**

\* \* \*

**Specifications for finished steel still equal shipments.**

\* \* \*

**Illinois Central to take bids this week on large rolling stock requirements.**

\* \* \*

**April shipments of pig iron running 15 per cent ahead of those of March.**

\* \* \*

**Structural steel business showing seasonal gains in West.**

\* \* \*

**Scrap market still dull but prices are steadier.**

bar market is dull, and common quotations are 1.90c. to 2c. a lb., Chicago. Specifications for rail steel bars continue to expand slowly. Individual orders are small, and users are demanding prompt shipments. Fall terms on fence posts may be announced early in May.

**Coke.**—Quotations on by-product foundry coke are steady at \$8 a ton, local ovens. Spot buying is in small volume.

**Bolts, Nuts and Rivets.**—Shipments of these commodities show little improvement over the rate in March. With the bulk of users covered by contracts, spot buying is of little importance. Manufacturers remain the largest buying group in this district.

**Ferroalloys.**—This market is quiet in sales, but shipments are in good volume. Tonnage users of spiegel-eisen are reported to have taken the bulk of 2500 tons, which will be shipped to Chicago by boat from England. The reported price to large users is \$41 a ton, delivered consumers' yards, for the 25 to 30 per cent grade.

**Old Material.**—The Chicago scrap market is drifting, with sellers finding it difficult to obtain orders and equally difficult to buy tonnages to apply against old commitments. It is probable that the latter phase of the market is preventing prices from reaching lower levels.

Steel mills continue to take scrap

freely because of the fact that ingot output is holding at a high level. Sellers believe that stocks of the heavy tonnage grades now in the hands of users are light and that heavy purchases will soon be made. Purchases of heavy melting steel are being made in small lots and at rather frequent intervals, and the prices paid are in the range of \$13 to \$13.50 a gross ton, delivered consumers' yards.

Cast grades are weak, with demand light and each new sale brings out a new low price. Weakness in cast iron borings is indicated by the low price paid to a producer, who usually gets a premium of at least 50c. a ton above the market. Rolled steel wheels continue weak, a recent sale having been at \$16.50 a gross ton, delivered. Re-rolling rails are moving slowly in a market which is strongly influenced by curtailed operations at re-rolling mills.

The Chicago & Alton is offering a list this week, and the Burlington will sell a tonnage next week.

Prices deliv'd Chicago district consumers.

Per Gross Ton

Basic Open-Hearth Grades:

Heavy melting steel.....	\$13.00 to \$13.50
Shoveling steel .....	13.00 to 13.50
Frogs, switches and guards, cut apart, and misc. rails	13.75 to 14.25
Hydraul. compressed sheets	11.75 to 12.25
Drop forge flashings.....	9.75 to 10.25
No. 1 busheling .....	11.00 to 11.50
Forg'd cast and r'd steel carwheels .....	16.00 to 16.50
Railroad tires, charg. box size .....	17.00 to 17.50
Railroad leaf springs cut apart .....	17.00 to 17.50

Acid Open-Hearth Grades:

Steel couplers and knuckles	15.50 to 16.00
Coil springs .....	17.50 to 18.00

Electric Furnace Grades:

Axle turnings .....	12.00 to 12.50
Low phos. punchings .....	14.50 to 15.00
Low phos. plates, 12 in. and under .....	14.00 to 14.50

Blast Furnace Grades:

Axle turnings .....	10.50 to 11.00
Cast iron borings .....	9.25 to 9.75
Short shoveling turnings..	9.25 to 9.75
Machine shop turnings....	7.50 to 8.00

Rolling Mill Grades:

Iron rails .....	14.00 to 14.50
Rerolling rails .....	15.00 to 15.50

Cupola Grades:

Steel rails, less than 3 ft..	16.00 to 16.50
Steel rails, less than 2 ft..	16.50 to 17.00
Angle bars, steel.....	15.00 to 15.50
Cast iron carwheels.....	14.50 to 15.00

Malleable Grades:

Railroad .....	16.75 to 17.25
Agricultural .....	15.00 to 15.50

Miscellaneous:

*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav. ....	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:

Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms .....	16.00 to 16.50
Iron car axles .....	25.00 to 25.50
Steel car axles .....	16.00 to 16.50
No. 1 railroad wrought...	12.25 to 12.75
No. 2 railroad wrought...	11.50 to 12.00
No. 1 busheling .....	9.00 to 9.50
No. 2 busheling .....	7.25 to 7.75
Locomotive tires, smooth..	14.50 to 15.00
Pipes and flues .....	8.75 to 9.25

Cupola Grades:

No. 1 machinery cast....	13.50 to 14.00
No. 1 railroad cast.....	12.75 to 13.25
No. 1 agricultural cast....	11.00 to 11.50
Stove plate .....	10.00 to 10.50
Grate bars .....	10.25 to 10.75
Brake shoes .....	10.00 to 10.50

\*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

# NEW YORK: Plates and Shapes Weaker—Steel Sales Not Broadening—Pig Iron Demand Steady

NEW YORK, April 15.—Pig iron demand, as reflected in weekly lettings, is rather steady, although not spectacular. Melters are buying often and in moderate lots rather than contracting for extended periods. The past week's sales, at 9000 tons, were of average proportions, although falling 3000 tons short of the total of the previous week.

The improvement in cast iron pipe production in the South has not reduced stock piles of Alabama furnaces sufficiently to cause any change in prices quoted in outside markets. Buffalo iron is still available at as low as \$16, base, furnace, and in some cases silicon differentials have been waived in part. The A. P. Smith Mfg. Co. has closed for 600 tons for delivery at Bloomfield, N. J., and the American Locomotive Co. has bought 400 tons for Schenectady, N. Y. Another recent purchase called for 1000 tons.

Inquiries include 2000 tons for the Garwood, N. J., plant of the Thatcher Co., 2000 tons for the New Britain, Conn., and Troy, N. Y., plants of the Eastern Malleable Iron Co., 125 tons of Bessemer and 350 tons of No. 1X for the Harrison, N. J., works of the Worthington Pump & Machinery Corporation, and 100 tons for the Elmwood Place, Ohio, plant of the same company.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	\$20.91 to \$21.41
*Buff. No. 2, del'd east.	
N. J. ....	19.28 to 19.78
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	19.39 to 21.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	19.89 to 21.52

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

\*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

**Reinforcing Bars.**—General contract bids on five New Jersey highway jobs, requiring a total of 1500 tons of bars, were taken April 14. The bars for the superstructure of the West Street, New York, elevated highway, section 1, division 1, contract 5, totaling 1500 tons, will be placed shortly.

Concrete bars in 40, 50 and 60-ft. lengths for mill shipment are quoted at 1.85c. a lb., Pittsburgh. Warehouse prices range from 2.44c. a lb., f.o.b. cars New York, for carloads or larger lots to 3.25c. for the smallest tonnages.

**Finished Steel.**—Steel companies are unable to detect any marked improvement in the volume of business in this territory. In fact, some lines appear to be quieter than they were a few weeks ago. Plates are a notable example. Orders for this commodity are few and seldom run more than a carload. Structural business is making slow progress, and, while most of

the larger fabricators have a comfortable volume of business on their books, they do not expect building to show substantial improvement before July.

Meanwhile, prices are becoming steadier on most products, but are weaker on plates and shapes. Large buyers of structural material are not paying above 1.94½c., delivered New York, and prices to the ordinary run of buyers range from 1.99½c. to 2.04½c., New York. Despite the fact that there is little business of sufficient size to test the plate market thoroughly, anything of attractive size can be bought at 1.85c., Coatesville, or 2.02½c., New York, though some mills still adhere to 1.90c., Coatesville. Low prices on structural shapes are said to have influenced concessions on plates in some instances.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.14c. to 2.19c.; plates, 2.02½c. to 2.07½c.; structural shapes, 1.94½c. to 2.04½c.

**Cast Iron Pipe.**—Pressure pipe prices are being maintained firmly. About 1000 tons of water pipe for the Department of Purchase, New York, was awarded to the United States Pipe & Foundry Co. and the

Donaldson Iron Co., and 200 tons of 6-in. water pipe for Yonkers, N. Y., was awarded to the Warren Foundry & Pipe Co. On about 225 tons of pipe for Newburgh, N. Y., a high bid of \$48.40 a ton, delivered, was submitted by the American Cast Iron Pipe Co., Birmingham, and a low bid of \$39.70 a ton, delivered, by the Warren Foundry & Pipe Co.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, \$39.90 to \$40.90; 4-in. and 5-in., \$42.90 to \$43.90; 3-in., \$49.90 to \$50.90. Class A and gas pipe, \$3 extra.

**Coke.**—Standard furnace coke continues at \$2.50 to \$2.60 a net ton, Connellsville, and buying is limited to occasional carload lots.

Special brands of beehive foundry coke continue at \$4.85 a net ton, ovens, or \$8.56 delivered to northern New Jersey, Jersey City and Newark, and \$9.44 to New York and Brooklyn. By-product foundry coke is quoted at \$9 to \$9.40, Newark or Jersey City; \$10.06, New York or Brooklyn.

**Old Material.**—Brokers have reduced their buying price for No. 1 heavy melting steel to \$13.50 a ton, delivered eastern Pennsylvania, based on the purchase last week of about 3000 tons at \$14, delivered by a Claymont, Del., consumer. For barge shipment to Bridgeport, Conn., and to Buffalo, however, \$11 and \$11.25 per ton, on barge, New York, are still being paid. The movement of No. 2 heavy melting steel to eastern Pennsylvania is light, but some brokers are paying \$13.50 and \$13.75 a ton, delivered to consumers in the Pittsburgh district, or \$8.20 to \$8.45, New York. Based on a recent small sale of blast furnace scrap to a Coatesville, Pa., consumer, one broker is paying \$9.50 a ton, delivered, or \$6 a ton, New York. Prices of other grades lack strength, and in certain cases have declined 25c. to 50c. a ton on recent sales.

Dealers buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	\$10.00 to \$11.25
Heavy melting steel (yard)	7.25 to 7.50
No. 1 hvy. breakable cast	9.25 to 10.00
Stove plate (steel works)	7.50 to 8.00
Locomotive grate bars	7.50 to 8.00
Machine shop turnings	6.50 to 7.00
Short shoveling turnings	7.00 to 7.25
Cast borings (blast fur. or steel works)	7.00
Mixed borings and turnings	6.00 to 6.50
Steel car axles	16.75 to 17.00
Iron car axles	20.00 to 20.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)	9.25
Forge fire	8.50 to 9.00
No. 1 railroad wrought	11.75
No. 1 yard wrought, long	10.75
Rails for rolling	10.50 to 11.00
Stove plate (foundry)	8.50 to 9.00
Malleable cast (railroad)	11.50 to 12.00
Cast borings (chemical)	9.00 to 9.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	\$15.00
No. 1 hvy. cast (columns, bldg. materials, etc.); cupola size	13.00
No. 2 cast (radiators, cast boilers, etc.)	12.50

## Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	5.05c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'd sheets (No. 10)	3.60c.
Black sheets (No. 24*)	3.80c. to 4.00c.
Galvanized sheets (No. 24*)	4.25c. to 4.50c.
Long terme sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut threads:	
¾ x 6 in. and smaller	.60
1 x 30 in. and smaller	.50 to 50 and 10
Carriage bolts, cut thread:	
¾ x 6 in. and smaller	.60
¾ x 20 in. and smaller	.50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	\$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

	Tin Plate (14 x 20 in.)	Prime Seconds
Coke, 100 lb. base box	\$6.45	\$6.20
Charcoal, per Box	A	AAA
IC	\$9.70	\$12.10
IX	12.00	14.25
IXX	13.90	16.00



# CLEVELAND: Automobile Releases of Steel Gain and Mill Operations Are Up to 85 Per Cent

**CLEVELAND, April 15.**—Demand for finished steel shows a slight improvement for nearly all products, the gain being well distributed among various consuming industries. Cleveland steel plants put on three additional open-hearth furnaces this week, and are now operating at 85 per cent of ingot capacity, as compared with 76 per cent last week. Orders for steel from the automotive industry have gained a little over last month. While production schedules of makers of low-priced cars are expanding, manufacturers of medium and high-priced automobiles are not increasing operations. Spring sales by dealers have not yet got under way in volume.

Price weakness has become conspicuous on the heavy-rolled products, and there appears to be less resistance to lower prices than is usually in evidence in a weak market. Nails are irregular, and concessions are again appearing on manufacturers' wire. Flat-rolled steel products are being well maintained at recent price levels.

**Pig Iron.**—The market is only moderately active. Sales by Cleveland interests were 18,000 tons during the week, compared with 21,000 tons during the previous week. Shipping orders by furnaces that sell considerable of their iron to the automotive industry were from 15 to 20 per cent larger during the first two weeks of April than during the corresponding period last month. However, it is not expected that this increase will be maintained through the month.

Several northern Ohio foundries made purchases during the week. The foundry industry in this territory continues rather slow, showing little, if any, improvement as compared with last month. Some foundries have as yet used very little of the iron they purchased for the first quarter.

Prices are firm at \$18.50, Cleveland, for foundry and malleable iron for outside shipment and \$19, furnace, for local delivery. Prices in other sections are unchanged. There is a range of from \$18.50 to \$19 in Indiana, and in Michigan furnaces are holding to \$19.50. Demand for low phosphorus iron shows some gain.

## Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	\$19.50
S'th'n fdy., sil. 1.75 to 2.25	19.51
Malleable .....	19.50
Ohio silvery, 8 per cent....	28.00
Basic Valley furnace.....	18.50
Stand. low phos., Valley....	\$26.50 to 27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6.01 from Birmingham.

**Semi-finished Steel.**—Specifications against second quarter contracts continue in good volume, and the local producer is able to keep 12 out of 14 open-hearth furnaces in operation. As consumers are under contract for all their requirements, there is no new inquiry. Prices are unchanged at \$33, Cleveland and Youngstown, for sheet bars, billets and slabs.

**Strip Steel.**—Demand for both hot and cold-rolled strip is light. Prices are steady at the recent range of 1.70c. to 1.80c., Pittsburgh, for wide strip and 1.80c. to 1.90c. for narrow, the lower prices being commonly

quoted for good lots. On most cold-rolled strip business, 2.55c., Cleveland, is the ruling price, 2.65c. being named in some cases for small-lot orders.

**Bars, Plates and Shapes.**—The demand for these products shows some gain, this being particularly true of steel bars. Highway and other construction work has stimulated the demand for reinforcing bars. In the building field, considerable fabricated work is pending, but the business is slow in being placed.

The general contract for the Young Men's Christian Association Building, Akron, requiring 1500 tons, has been awarded. The 1400 tons of plates required for a Cleveland water pipe line have been placed with the Otis Steel Co. by the Biggs Boiler Works, which will fabricate the pipe.

Prices are lower and weak. Shapes and plates have declined to 1.80c., Pittsburgh, for the ordinary run of orders, the 1.85c. price having disappeared. Contracts are being revised to the lower price. Large-lot and preferred buyers are able to get further concessions. On steel bars, the market has settled to a 1.80c., Cleveland, price and that price is now being generally quoted by outside mills.

**Sheets.**—Mills were able to increase operations slightly the past week. Independent plants are now running at about 75 per cent of capacity. Those making common black sheets are operating somewhat better than producers of full-finished sheets. A local automobile body manufacturing plant increased specifications 10 per cent this week to a weekly schedule of 16,500 bodies.

With the increased releases, some of the mills are able to reduce their stocks of unshipped sheets. New demand continues light.

**Rails.**—The Wheeling & Lake Erie Railroad has purchased 2000 tons of standard rails, supplementing a recent purchase, and the Akron, Canton & Youngstown has bought 500 tons.

**Wire Products.**—Nail prices are

weak and unsettled, although the low prices that have appeared in some sections are not in evidence here. While the open price range is \$2.20 to \$2.30 a keg to jobbers, the higher price is now being quoted to retailers or a 5c. decline. Manufacturers' wire is being shaded \$2 a ton to 2.30c.

**Warehouse Business.**—One hardware jobber has reduced its price on steel bars \$5 a ton to 2.75c., but is maintaining this as a flat price, not having adopted the quantity differentials recently put in effect by other warehouses.

**Old Material.**—Mills in the Youngstown district are taking scrap somewhat more freely than recently, but shipments by Cleveland mills are still greatly restricted. Local prices are unchanged. Dealers are paying \$15.50 to \$15.75 for heavy melting and \$15 to \$15.25 for compressed sheet steel for Youngstown delivery.

Considerable activity has developed in scrap in Detroit for water shipment. One Buffalo consumer is credited with a purchase of 20,000 tons of selected No. 1 heavy melting steel, and to fill this contract dealers are paying \$12.50, delivered Detroit dock. Other interests bought 29,000 tons of mixed borings and turnings at \$11, delivered in Buffalo, or equivalent to about \$9, Detroit dock. Water shipments will afford considerable relief to Detroit scrap yards, which are well filled. A Detroit automobile company sold 4000 tons of borings and turnings offered on its April list at \$7.75. The same grade brought \$7 in Flint, and compressed sheet steel offered on Detroit lists brought \$11.75 to \$12.

## Prices per gross ton delivered consumers' yards:

<b>Basic Open-Hearth Grades:</b>		
No. 1 heavy melting steel...	\$13.25 to	\$13.75
No. 2 heavy melting steel...	12.75 to	13.25
Compressed sheet steel....	12.75 to	13.00
<b>Light bundled sheet</b>		
stampings .....	11.00 to	11.50
Drop forge flashings.....	11.00 to	11.50
Machine shop turnings....	9.00 to	9.25
Short shovelling turnings...	10.50 to	11.00
No. 1 railroad wrought....	13.00 to	13.50
No. 2 railroad wrought....	14.00 to	14.50
No. 1 busheling .....	12.00 to	12.50
Pipes and flues .....	9.00 to	9.50
Steel axle turnings.....	12.50 to	13.00
<b>Acid Open-Hearth Grades:</b>		
Low phos., forging crops..	17.75 to	18.00
Low phos., billet bloom		
and slab crops .....	18.50 to	18.75
Low phos., sheet bar crops	18.00 to	18.50
Low phos., plate scrap....	18.00 to	18.50
<b>Blast Furnace Grades:</b>		
Cast iron borings .....	10.00 to	10.50
Mixed borings and short		
turnings .....	10.00 to	10.50
No. 2 busheling .....	9.00 to	9.50
<b>Cupola Grades:</b>		
No. 1 cast .....	15.00 to	15.50
Railroad grate bars .....	11.00 to	12.00
Stove plate .....	12.00 to	12.50
Rails under 3 ft. ....	18.50 to	19.50
<b>Miscellaneous:</b>		
Rails for rolling .....	16.25 to	16.50
Railroad malleable .....	16.00 to	16.50

# PHILADELPHIA: Steel Buying Smaller and Prices Lack Firmness—Further Decline in Scrap

PHILADELPHIA, April 15.—Steel orders have declined slightly in the past week but mills are still maintaining operations at a fair level. Consumers manufacturing for the automobile industry are more actively inquiring for material, especially sheets, but have been buyers only of small lots. Concessions to such buyers of \$1 a ton on black and \$2 a ton on blue annealed sheets are not uncommon, with mills seeking to increase their backlogs of orders. Concessions of \$1 a ton on plates from 1.85c., Coatesville, Pa., which appeared in previous weeks are less evident on the small and medium-sized tonnages in the present market.

**Pig Iron.**—Purchases of foundry iron from eastern Pennsylvania furnaces seldom exceed one or two carloads, for which \$19.50 a ton, furnace, is generally maintained. Sellers of Southern iron are quoting \$12.50 to \$13 a ton, base furnace, or \$17.75 to \$18.25 a ton, on cars Philadelphia, and are booking a substantial tonnage, considering the small requirements of consumers in this district at present. An eastern Pennsylvania consumer of basic iron has been offering to buy about 6000 tons at a price said to be less than \$19 a ton, delivered. The Delaware River furnace, which was expected to blow out at the end of last week, having completed its contracts for low phosphorus iron, has been banked, but may resume operation if the pig iron market shows improvement in the next few weeks.

Prices per gross ton at Philadelphia:	
East. Pa. No. 2, 1.75 to 2.25 sil.	\$20.26 to \$20.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.76 to 21.26
East. Pa. No. 1X, 2.12 to 2.75 sil.	21.26 to 21.76
Basic (del'd east. Pa.)	19.00 to 19.50
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. east. Pa. furnace)	24.00
Cop. br'g low phos. (f.o.b. furnace)	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.44 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

**Bars.**—Quotations range from 1.80c. to 1.85c. a lb., Pittsburgh, or 2.12c. to 2.17c., delivered Philadelphia. The minimum price applies as a rule on orders for a carload or more, and the higher quotation on lots of considerably less than a carload.

**Reinforcing Bars.**—Reinforced concrete projects call for only small lots of bars, usually less than 100 tons. Quotations are unchanged at 1.90c. to 1.95c., Pittsburgh, or 2.22c. to 2.27c., Philadelphia, for billet steel bars, with the extra for cutting to length usually omitted. Rail steel bars are 1.70c. to 1.75c., Franklin, Pa., and Tonawanda, N. Y., or 2.02c. to 2.07c., delivered Philadelphia, with no extra for cutting to length or bending.

**Shapes.**—Demand has declined in the past week, but mills report little recession in operating rates. Prices

still lack firmness, ranging from 1.75c. to 1.85c., f.o.b. nearest mill to consumer, or 1.81c. to 1.91c., delivered Philadelphia. On large lots of shapes, 1.75c., mill, is occasionally shaded \$1 a ton. A fair tonnage of construction work is in the market in this district, consisting mostly of small projects, with the exception of an office building in Philadelphia requiring 6000 tons and a viaduct calling for 1700 tons.

**Plates.**—Buying is generally limited to small orders. Tank builders, boiler makers and structural steel fabricators are the principal buyers. The railroads are inactive, and little ship-building material has been placed, although a substantial tonnage is in prospect. Quotations range from 1.85c. to 1.90c. a lb., Coatesville, Pa., or 1.95c. to 2c., delivered Philadelphia. Large preferred buyers of plates and structural steel fabricators have been granted concessions of \$1 a ton on desirable specifications, but these appear to be less common than a week ago.

**Sheets.**—Inquiry by manufacturers of automobile bodies and parts has improved, but buying has been limited to small lots of black and blue annealed sheets, with mills actively competing for the small tonnage being offered. Radio manufacturers are operating on limited schedules, and most of their buying is of small lots of special quality sheets for experimental purposes. Black sheets are quoted at 2.65c., Pittsburgh, or 2.97c.,

delivered Philadelphia, and on desirable orders concessions of \$1 a ton to 2.60c., Pittsburgh, or 2.92c., Philadelphia, are not uncommon. High finished sheets continue to be quoted on a black sheet base of 2.55c., Pittsburgh. Galvanized sheets are quiet, and the price is unchanged at 3.30c., Pittsburgh, or 3.62c., delivered Philadelphia. Blue annealed sheets are 2.25c., Pittsburgh, or 2.57c., delivered Philadelphia, for No. 13 gage, and blue annealed plates are 2.10c., Pittsburgh, or 2.42c., Philadelphia, for No. 10 gage. On tonnages of blue annealed sheets for automobile manufacturers and other preferred buyers, concessions of \$1 to \$2 a ton are usually granted.

**Old Material.**—The trend of prices is still downward. A Claymont, Del., mill has closed on about 3000 tons of No. 1 heavy melting steel at \$14 a ton, delivered, but sellers point out that there is no surplus of this grade and a large contract at this price might prove difficult to execute profitably. A Phoenixville, Pa., mill has bought stove plate at \$10.50 a ton, delivered, a 50c. decline from the previous purchase price, and blast furnace scrap has been sold at \$10 a ton, delivered to a Coatesville consumer, also a 50c. decline.

Prices per gross ton delivered consumers' yards, Philadelphia district:	
No. 1 heavy melting steel	\$14.00 to \$14.50
No. 2 heavy melting steel	12.00
Heavy melting steel (yard)	11.00 to 11.50
No. 1 railroad wrought	15.00 to 15.50
Bundled sheets (for steel works)	11.50
Hydraulic compressed, new	13.00 to 13.50
Hydraulic compressed, old	12.00 to 13.00
Machine shop turnings (for steel works)	10.50
Heavy axle turnings (or equiv.)	12.50 to 13.00
Cast borings (for steel works and roll. mill)	11.00
Heavy breakable cast (for steel works)	13.50
Railroad grate bars	11.00
Stove plate (for steel works)	10.50 to 11.00
No. 1 low phos., hvy., 0.04% and under	20.50 to 21.50
Couplers and knuckles	20.00 to 20.50
Rolled steel wheels	19.50 to 20.00
No. 1 blast furnace scrap	10.00 to 10.50
Wrot. iron and soft steel pipes and tubes (new specific.)	14.00
Shafting	19.00
Steel axles	21.00 to 21.50
No. 1 forge fire	13.00
Cast iron carwheels	15.00
No. 1 cast	15.00 to 15.50
Cast borings (for chem. plant)	13.50 to 14.00
Steel rails for rolling	15.00 to 15.50

Pilling & Co., Inc., Philadelphia, New York and Boston, has been appointed sales agent in Massachusetts, Vermont, New Hampshire and Maine for the Tonawanda Iron Corporation, Buffalo.

## Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, 1/4-in. and heavier	2.70c.
Plates, 1/8-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Reinforc. steel bars, sq., twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.55c.
Steel bands, No. 12 to 1/4-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.80c.
*Galvanized sheets (No. 24)	4.45c.
Light plates, blue annealed (No. 10)	3.25c.
Blue ann'd sheets (No. 13)	3.40c.
Diam. pat. floor plates, 1/4-in.	5.30c.
Swedish iron bars	6.60c.

\*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.  
 †For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.



## PACIFIC COAST

**SAN FRANCISCO, April 12.—(By Air Mail)**—The structural steel market was active this week, several fair-sized projects having been placed and a number of new inquiries came out for figures. Among these were 2750 tons of shapes and plates for the Pacific Fruit Express Co. and 1000 tons for a chemical plant for the Shell Oil Co. Prices continue on a fairly firm basis.

**Pig Iron.**—Little of importance occurred in the pig iron market, sales and inquiries being confined to unimportant lots. Prices are unchanged.

*Prices per gross ton at San Francisco:*

*Utah basic .....	\$25.00 to \$26.00
*Utah fdy., sil. 2.75 to 3.25 .....	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25 .....	25.00 to 26.00

\*Delivered San Francisco.

\*\*Duty paid, f.o.b. cars San Francisco.

**Finished Steel.**—Awards of reinforcing steel bars were limited to lots of less than 100 tons. The Los Angeles County Water Works District No. 29 will open bids on May 5 for 130 tons. Prices on out-of-stock material in the San Francisco district continue at 2.30c., base, on carload lots and up to 2.60c. on smaller quantities. Quotations in the Los Angeles district are \$2 a ton higher. Movement of mild steel bars recently has involved small lots only. Prices are firm at 2.35c., c.i.f.

Bids will be opened April 14 on 365 tons of 3/16 and 1/4-in. plates for a 30-in. welded steel pipe line at Everett, Wash. Plate quotations continue generally at 2.20c., c.i.f.

The Herrick Iron Works has booked

## Structural Steel Leads in Market Activity—Prices Steady

### Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes .....	2.45c. to 2.95c.
Soft steel bars .....	2.40c. to 2.95c.
Black sheets (No. 24) .....	3.65c. to 4.30c.
Blue ann'd sheets (No. 10) .....	3.05c. to 3.55c.
Galv. sheets (No. 24) .....	4.30c. to 4.80c.
Struc. rivets, 1/2-in. and larger .....	5.65c.
Com. wire nails, base per keg .....	\$3.40
Cement c'd nails, 100 lb. keg .....	3.40

300 tons of plates and shapes for a ship loading platform for the State Harbor Commission, San Francisco. This is the first award involving battleship deck flooring on the Pacific Coast, over 2000 sq. ft. of 5/16-in. plate being involved. Structural shapes are firm at 2.35c., c.i.f.

**Cast Iron Pipe.**—The American Cast Iron Pipe Co. secured 300 tons of 4 to 10-in. Class 150 pipe for the Bear Gulch Water Co., Menlo Park, Cal. The only other award of 100 tons or more was placed with Argenteri & Colorossi and involved 268 tons of 8 and 12-in. Class B pipe for Twenty-ninth Avenue, N. W., Seattle. Bids were opened on 617 tons of 4 to 12-in. Class 150 pipe for Santa Ana, Cal. Renton, Wash., will open bids on April 15 for 530 tons of 4 to 12-in. pipe.

**Warehouse Prices.**—Steel jobbers in the San Francisco district, after many weeks of price cutting, have adopted a differential price schedule. These quotations are based on the following quantities; Straight carloads, mixed carloads, lots of 1000 lb. and over, lots of 500 to 999 lb. and lots of less than 500 lb.

that has brought a decided reduction in backlogs. Reinforcing bar order books are growing, though they are not as full as a year ago.

Active open-hearths total 19, one less than last week.

**Cast Iron Pipe.**—The National Cast Iron Pipe Co. has been awarded contract for the project at Shreveport, La., to require over 1000 tons of 12 to 20-in. pipe. A project at Bruceton, Tenn., requiring about 25,000 ft. of 2 to 8-in. pipe has been let to the United States Pipe & Foundry Co. Contractors have placed orders for several small tonnages. District plants are bidding on 2100 tons to be awarded this week by Milwaukee, Wis. The tonnage up for figures in the Southern territory is light.

Plants are operating on the best schedules of the year, which are considerably better than 30 days ago. Deferred deliveries are reported on some of the large sizes of pipe. Prices remain firm at \$37 to \$38 a ton, Birmingham, for 6-in. and larger diameters.

**Old Material.**—Only a few inquiries are finding their way into the market. Steel mill commitments continue light, and foundries show only the slightest interest in iron grades. Dealers have made no change in quotations for some time.

*Prices per gross ton, deliv'd Birmingham dist. consumers' yards:*

Heavy melting steel .....	\$13.00 to \$13.50
Scrap steel rails .....	14.00
Short shoveling turnings ..	9.00
Cast iron borings .....	9.00
Stove plate .....	11.50 to 12.00
Steel axles .....	22.00
Iron axles .....	23.00
No. 1 railroad wrought .....	10.00 to 10.50
Rails for rolling .....	15.50
No. 1 cast .....	13.00
Tramcar wheels .....	12.50
Cast iron carwheels .....	13.00 to 13.50
Cast iron borings, chem. ..	13.50 to 14.00

## BIRMINGHAM

### New Business in Steel and Pig Iron Steady But Shows No Gain

**BIRMINGHAM, April 15.**—The volume of new business in the pig iron market is not impressive, but the fact that it is holding its own reflects a steady melt, as nearly all the melters who did not cover for this quarter are buying only for orders actually booked. Those who have iron under contract are specifying well. Shipments so far this month are estimated to have been at a rate slightly better than those of March. Releases by soil pipe shops were larger last week than for some time. All sales for the Birmingham district take the \$14 base price for No. 2 foundry.

There has been no change in furnace operations for some time. Of the 17 active furnaces, nine are on foundry iron, six on basic iron, one on recarburizing iron and one on ferromanganese.

*Prices per gross ton, f.o.b. Birmingham dist. furnaces:*

No. 2 fdy., 1.75 to 2.25 sil. ....	\$14.00
No. 1 fdy., 2.25 to 2.75 sil. ....	14.50
Basic .....	14.00

**Finished Steel.**—New business about held its own last week, though the aggregate is possibly a little under the March rate. Lines regularly active at this season are considered to be doing as well as a year ago, with the exception of structural shapes and wire products. The spring trade in the latter line got off to a slow start and has not yet reached its normal stride. A better demand for steel shapes for bridges is beginning to offset somewhat the slump in demand from the general building field.

Allowing for time lost in keeping equipment in condition, ingot production is at capacity rates and finishing mills are using the output. Minimum quotations on blue annealed sheets have been reduced \$1 a ton. All other prices are the same.

Structural steel fabricating shops have booked several small orders in the past week and report indications of an improvement in the condition

### Detroit Scrap Steady

**DETROIT, April 15.**—There has been little change in prices on old material in the district during the past week.

*Dealers' buying prices per gross ton, f.o.b. cars, Detroit:*

Hvy. melting and shov. steel .....	\$11.50 to \$12.00
Borings and short turnings ..	8.00 to 8.50
Long turnings .....	7.00 to 7.50
No. 1 machinery cast .....	11.50 to 12.00
Automotive cast .....	13.00 to 13.50
Hydraul. comp. sheets .....	11.25 to 11.75
Stove plate .....	9.00 to 9.50
New No. 1 busheling .....	10.50 to 11.00
Old No. 1 busheling .....	8.75 to 9.25
Sheet clippings .....	8.25 to 8.75
Flashings .....	10.00 to 10.50

Harshaw Chemical Co., manufacturer of nickel anodes, salts and chloride, chromic acid, cadmium anodes, cadmium oxide, and distributor of sodium cyanide and a full line of heat treating and plating chemicals, has just purchased a four-story building at 1945 East Ninety-seventh Street, Cleveland, to house the executive and sales offices and laboratories.

## CINCINNATI

### Demand for Pig Iron Still Slow—Sheet Mill Operation at 60 Per Cent

CINCINNATI, April 15.—Pig iron consumers are buying only for immediate needs, and the demand is below the normal level for this season. Sales last week were about 4250 tons, of which 475 tons was silvery. Foundry operations are spotty, with some plants curtailing production and purchases.

The week's orders included 300 tons of silvery for shipment to Michigan, 200 tons of foundry iron to each of two central Ohio consumers and 250 tons to a third. A northern Ohio buyer bought 500 tons, and an Indiana consumer 400 tons.

Prices of all grades of iron are unchanged. Northern iron is firm at \$18.50, Lake furnace, while Southern iron is not strong at \$13, Birmingham.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	\$19.89 to \$20.39
Ala. fdy., sil. 1.75 to 2.25	16.69 to 17.69
Ala. fdy., sil. 2.25 to 2.75	17.19 to 18.19
Tenn. fdy., sil. 1.75 to 2.25	17.19 to 17.69
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Coke.—Shipments are at about the March rate, the foundry melt showing no gain this month.

Finished Steel.—Sheet mill schedules remain at about 60 per cent, but orders in the last week were scarcely sufficient to maintain this rate. The only sign of an improvement is in demands from road construction companies, but this is slight.

Old Material.—The scrap market has an undertone of uncertainty. Dealers are making purchases sparingly at unchanged prices. Yard sup-

#### Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforce. bars	3.30c.
Rail steel reinforce. bars	3.15c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex.	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'd sheets (No. 10)	3.45c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'd wire, per 100 lb.	\$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c'd nails, base 100 lb. keg	2.95
Chain, per 100 lb.	10.25
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in.	\$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00

plies are increasing. The Southern Railway is offering its usual list, and the Louisville & Nashville will take bids on 10,500 tons, of which 4500 tons is rails.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	\$11.50 to \$12.00
Scrap rails for melting	13.25 to 13.75
Loose sheet clippings	8.00 to 8.50
Bundled sheets	10.75 to 11.25
Cast iron borings	8.25 to 8.75
Machine shop turnings	8.00 to 8.50
No. 1 busheling	10.00 to 10.50
No. 2 busheling	6.50 to 7.00
Rails for rolling	13.50 to 14.00
No. 1 locomotive tires	14.25 to 14.75
No. 2 railroad wrought	11.25 to 11.75
Short rails	17.75 to 18.25
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	18.50 to 19.00
No. 1 railroad cast	15.00 to 15.50
Burnt cast	10.00 to 10.50
Stove plate	8.25 to 8.75
Brake shoes	10.00 to 10.50
Agricultural malleable	14.00 to 14.50
Railroad malleable	15.00 to 15.50

little demand. The Warren tin mill is running at capacity, although its operations are on a strictly hand-to-mouth basis, and specifications in the last week have been rather light.

Demand for building pipe at last shows considerable improvement, and local mills have booked some line pipe business. The small electric welding unit of the Republic company is engaged at capacity, and the larger mill, employing the same patents, will go into production about the middle of May. The Republic company has been unable to bid on several pipe projects because of early delivery dates, but will be able to start its new mill with a comfortable backlog tonnage. Demand for bars is still only fair, but is well diversified, and will likely expand gradually as spring demand gets under way. Local consumers of steel are again calling upon Youngstown mills for heavy shipments of sheet steel, plates and strip for building products and metal furniture, and some makers are no longer forced to depend on the automobile industry for so much of their tonnage.

Steel prices are still an unfavorable market factor, but are becoming better established at recent low levels. Bars are quotable at 1.80c. to 1.85c., and the lower figure represents the absolute minimum so far as Youngstown mills are concerned. Auto body sheets are well established at 3.80c., Pittsburgh, and black sheets are quotable at 2.55c. to 2.65c. The lower figure applies only to tonnage requiring extras for pickling and cold-rolling, and local mills are getting 2.65c. on the general run of orders for one pass box annealed material. Blue annealed sheets and light plates are still quotable at 2.25c. and 2.10c. respectively for the jobbing mill product, with continuous mill material selling generally at prices \$4 a ton less. Galvanized sheets are unchanged at 3.30c., Pittsburgh, with concessions confined mostly to large jobbers, and then principally in the competitive territory of the South and Southwest. Hot-rolled strip is holding at 1.70c. and 1.80c., and cold-rolled at 2.55c. Occasional concessions on the latter material have been made for tubing stock. The nail market lacks strength on spot tonnage, with \$2.15 and \$2.20 per keg reported on a few transactions. Pipe prices are being rigidly held at the recent \$4 a ton reduction.

The pig iron market is still very quiet, and both merchant and steel making stacks in the Valley district have large stock piles. No changes in prevailing quotations of \$18.50, Valley, for basic and foundry iron, and \$19 for malleable and Bessemer are contemplated, although it is admitted that large contract buyers are getting their basic iron at a much better price. Billets, slabs and sheet bars are still nominally quoted at \$33, Pittsburgh or Youngstown, but this figure lacks the test of any considerable buying. The scrap market is quiet so far as new sales are concerned, but shipments are heavier at some points.

## YOUNGSTOWN

### Steel Specifications Ahead of Those in Same Period in March

YOUNGSTOWN, April 14.—Slight acceleration in the demand for steel from manufacturers of building products, and continued improvement in the requirements of makers of small automobiles has given this market a better tone. Specifications so far this month are considerably ahead of the corresponding March period with nearly all companies, and the outlook for fair spring business is rather good. Valley mills hope to better their first quarter output by at least 10 per cent in the present quarter and improved operations in both open-hearth and finishing departments indicate that this can be done.

The Steel Corporation plants in the district are running at about 75 per cent of capacity in their steel-mak-

ing departments, and the Republic company is at a better rate largely because of capacity operations at Warren. The Youngstown Sheet & Tube Co. had been running half of its open-hearth furnaces and may add one or two this week. This places the steel-making production of the district at 70 to 75 per cent of theoretical full, and finishing mills in general are running at about the same rate.

Pipe operations have been improving in the last week or two, and are now at about 60 per cent. Bar mills are running at 65 per cent, and sheet and strip capacity is engaged on the whole at better than 75 per cent. An exception must be made in the case of cold-rolled strip, for which there is



# ST. LOUIS Orders for Plates and Galvanized Sheets Improve—Pig Iron Movement Steady

ST. LOUIS, April 15.—With the sale of 5000 tons of basic iron to an East Side melter for prompt delivery and 2000 tons of malleable and foundry grades in scattered lots ranging up to 600 tons for shipment over the remainder of the second quarter by the St. Louis Gas & Coke Corporation, the pig iron market was looking up this week. Sales by Southern makers were light. Buying for the most part continues from hand to mouth. The market is steady. April shipments of the local makers are fully equal to the movement in March up to this date.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	\$19.50
Malleable, f.o.b. Granite City	20.00
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	\$17.42 to 18.42
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

**Finished Steel.**—The Granite City Steel Co. reports a slight improvement in orders for tank plates and galvanized sheets. Common black sheets are not in great demand and orders for tin plate are not as heavy as they were at the corresponding period last month. While prices are low, they are believed to be more stable than for some time past. Orders are well diversified, coming from virtually all lines of manufacture. Jobbers' specifications are light, but should improve if the weather continues satisfactory.

The Laclede Steel Co. got the award of 1400 tons of reinforcing bars for a terminal elevator at Houston, Tex., and the Mississippi Valley Structural Steel Co. was awarded 500 tons of structural and miscellaneous steel for the Herbert S. Hadley Vocational School.

**Old Material.**—The scrap market continues weak. There is no buying by the mills, and orders in hands of dealers are reported to be very low. Steel car axles, No. 1 railroad wrought, cast iron carwheels, No. 1 railroad cast,

stove plate and agricultural malleable are 50c. off, while No. 1 machinery cast and railroad malleable are 25c. less than last week.

Railroad lists: Chesapeake & Ohio, 43,573 tons; Louisville & Nashville, 10,550 tons; Atchison, Topeka & Santa Fe, 5325 tons; Missouri-Kansas-Texas, 1400 tons; International-Great Northern, 800 tons; Great Northern, 70 carloads; New York, Chicago & St. Louis, 41 carloads; Nashville, Chattanooga & St. Louis, 25 carloads; St. Louis Southwestern, 24 carloads; Chicago, Milwaukee, St. Paul & Pacific, 16 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:  
Selected heavy melting steel .....\$13.00 to \$13.50

No. 1 heavy melting or shoveling steel.....	12.00 to 12.50
No. 2 heavy melting or shoveling steel.....	11.00 to 11.50
No. 1 locomotive tires.....	14.50 to 15.00
Misc. stand-sec. rails including frogs, switches and guards, cut apart.....	12.75 to 13.25
Railroad springs.....	15.25 to 15.75
Bundled sheets.....	9.00 to 9.50
No. 2 railroad wrought.....	12.00 to 12.50
No. 1 busheling.....	9.75 to 10.25
Cast iron borings and shoveling turnings.....	9.25 to 9.75
Iron rails.....	13.00 to 13.50
Rails for rolling.....	14.00 to 14.50
Machine shop turnings.....	6.75 to 7.25
Heavy turnings.....	9.00 to 9.50
Steel car axles.....	17.50 to 18.00
Iron car axles.....	25.50 to 26.00
Wrot. iron bars and trans.....	20.00 to 20.50
No. 1 railroad wrought.....	10.50 to 11.00
Steel rails, less than 3 ft.....	15.50 to 16.50
Steel angle bars.....	12.50 to 13.00
Cast iron carwheels.....	13.50 to 14.00
No. 1 machinery cast.....	15.00 to 15.50
Railroad malleable.....	14.00 to 14.50
No. 1 railroad cast.....	13.50 to 14.00
Stove plate.....	10.50 to 11.00
Relay. rails, 60 lb. and under.....	20.50 to 23.50
Relay. rails 70 lb. and over.....	26.50 to 29.00
Agricult. malleable.....	12.50 to 13.00

## BOSTON Pig Iron Demand Dull, with Sales not Exceeding 1500 Tons—Scrap Market Quiet

BOSTON, April 15.—Pig iron sales in New England the past week did not amount to more than 1500 tons and were spread out among five furnaces. A Connecticut foundry has yet to cover on 2000 tons of malleable iron, which is offered by at least one Buffalo furnace at \$17 a ton, furnace. No other sizable business is in sight, and furnace representatives look for no appreciable increase in business until the second quarter. A Buffalo district furnace, heretofore inactive in New England, is now represented here, making four Buffalo furnaces now competing for business.

Foundry iron prices per gross ton deliv'd to most New England Points:

†Buffalo, sil. 1.75 to 2.25..	\$20.28 to \$21.28
†Buffalo, sil. 2.25 to 2.27..	20.78 to 21.78
*Buffalo, sil. 1.75 to 2.25..	20.91 to 21.91
*Buffalo, sil. 2.25 to 2.75..	21.41 to 22.41
Va., sil. 1.75 to 2.25.....	25.21
Va., sil. 2.25 to 2.75.....	25.71
*Ala., sil. 1.75 to 2.25.....	22.61
*Ala., sil. 2.25 to 2.75.....	23.11
†Ala., sil. 1.75 to 2.25.....	18.75
†Ala., sil. 2.25 to 2.75.....	19.25

Freight rates: \$4.91 all rail and \$4.28 rail and water from Buffalo; \$5.21 all rail from Virginia; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

\*All rail rate.  
†Rail and water rate.

**Cast Iron Pipe.**—Georgetown, Mass., contemplates putting in a water system to cost \$150,000; Walpole, Mass., will require 32,800 ft. of 6 to 12-in. pipe; Milton, Mass., is to purchase \$75,000 worth of pipe and equipment; Arlington, Mass., will buy \$70,000 of pipe for a water main extension; and Epping, N. H., is to install a water system for which pipe will be purchased. Pipe prices are steady at \$37 to \$38 a ton, on cars foundry, for 6-in. and larger dimensions.

**Reinforcing Bars.**—The market is growing more active, but current

bookings are in small lots and aggregate sales for the week did not exceed 500 tons. With the stepping up in sales, prices appear steadier. Quotations made openly are: 1 to 5-ton lots, 3.06½c. a lb., base, from stock; 5 to 99 tons, 2.66½c.; 100-ton and larger lots, 2.56½c.

**Old Material.**—Old material prices continue soft, and business is quiet and largely confined to about half a dozen kinds of scrap. Small tonnages of No. 1 heavy melting steel were purchased the past week, mostly at \$9.10 to \$9.50 a ton on cars shipping point, for eastern Pennsylvania delivery, and No. 2 steel was bought at \$8.30 for Weirton, W. Va., deliv-

### Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates.....	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees.....	3.365c.
Zees.....	3.465c.
Soft steel bars, small shapes.....	3.265c.
Flats, hot-rolled.....	4.15c.
Reinforcing bars.....	3.265c. to 3.54c.
Iron bars—	
Refined.....	3.265c.
Best refined.....	4.60c.
Norway rounds.....	6.60c.
Norway squares and flats.....	7.10c.
Spring Steel—	
Open-hearth.....	5.00c. to 10.00c.
Crucible.....	12.00c.
Tie steel.....	4.50c. to 4.75c.
Bands.....	4.015c. to 5.00c.
Hoop steel.....	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.....	*3.55c. to 5.55c.
Squares and flats.....	*4.05c. to 7.05c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.50c.
	Per Cent Off List
Machine bolts.....	50 and 5
Carriage bolts.....	50 and 5
Lag screws.....	50 and 5
Hot-pressed nuts.....	50 and 5
Cold-punched nuts.....	50 and 5
Stove bolts.....	70 and 10

\*Including quantity differentials.

### Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Cold-fin, rounds, shafting, screw stock.....	3.75c.
Black sheets (No. 24).....	4.25c.
Galv. sheets (No. 24).....	4.85c.
Blue ann'l'd sheets (No. 10).....	3.45c.
Black corrug. sheets (No. 24).....	4.30c.
Galv. corrug. sheets.....	4.90c.
Structural rivets.....	4.15c.
Boiler rivets.....	4.15c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more.....	65
Less than 100 lb.....	60
Machine bolts.....	60
Carriage bolts.....	60
Lag screws.....	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50

ery. Mixed borings and turnings have a fair call, and forge scrap is moving in moderate tonnages. A steamer finished loading 1300 tons of scrap for Japan. Exporters now say there is some doubt about a steamer leaving Boston this month for Danzig, but that in all probability another boat will load here this month for Japan.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.	\$9.10 to \$9.75
Scrap T rails.	9.50 to 9.75
Scrap girder rails.	8.50 to 9.00
No. 1 railroad wrought.	10.00 to 10.50
Machine shop turnings.	5.50 to 6.00
Cast iron borings (steel works and rolling mill)	5.50 to 6.00
Bundled skeleton, long.	8.50 to 8.75
Forge flashings.	8.50 to 9.00
Blast furnace borings and turnings.	5.25 to 5.60
Forge scrap.	7.00 to 8.00
Shafting.	14.00 to 14.50
Steel car axles.	15.50 to 16.50
Wrought pipe, 1 in. in diameter (over 2 ft. long)	9.00 to 9.25
Rails for rolling.	10.50 to 11.00
Cast iron borings, chemical	8.50 to 9.00

Prices per gross ton deliv'd consumers' yards:

Textile cast.	\$12.50 to \$13.50
No. 1 machinery cast.	14.50 to 15.25
No. 2 machinery cast.	14.00 to 14.50
Stove plate.	10.50 to 11.00
Railroad malleable.	16.00 to 16.50

## Canada

### Many Pig Iron Buyers Covered to June

TORONTO, April 15.—With the majority of melters who place forward contracts covered to the end of June, contract buying of pig iron has fallen off. Current demand is mostly for spot delivery, but in some respects this demand is being stepped up, and weekly sales now run into higher figures. Inquiries are still coming to hand for iron for delivery at the opening of navigation.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.	\$22.60
No. 2 fdy., sil. 1.75 to 2.25.	22.10
Malleable.	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.	\$24.00
No. 2 fdy., sil. 1.75 to 2.25.	23.50
Malleable.	24.00
Basic.	22.50
Imported Iron, Montreal Warehouse	
Summerlee.	\$33.50
Carron.	33.00

**Old Material.**—Mills are taking in small tonnages of steel scrap for immediate needs, but are not placing contracts for forward delivery.

Dealers' buying prices:

	Per Gross Ton	Toronto	Montreal
Heavy melting steel.	\$9.00	\$8.00	
Rails, scrap.	11.00	9.00	
No. 1 wrought.	9.00	11.00	
Machine shop turnings.	7.00	6.00	
Boiler plate.	7.00	6.50	
Heavy axle turnings.	7.50	6.50	
Cast borings.	6.50	5.00	
Steel borings.	6.50	6.00	
Wrought pipe.	6.00	6.00	
Steel axles.	14.00	17.00	
Axles, wrought iron.	16.00	19.00	
No. 1 machinery cast.		16.00	
Stove plate.		12.00	
Standard carwheels.		14.50	
Malleable.		13.00	
Per Net Ton			
No. 1 mach'y cast.	\$15.00		
Stove plate.	11.00		
Standard carwheels.	14.00		
Malleable scrap.	11.00		

## BUFFALO Pig Iron Sales About 7500 Tons—Steel Mill Operations Unchanged—Scrap Dull

BUFFALO, April 15.—Sales of pig iron in this territory in the past week were about 7500 tons. One company which sold about 3000 tons in all had one order for 2000 tons of foundry from the East. It is understood that the price was \$16.50, base. The Worthington Pump & Machinery Corporation is seeking 200 to 300 tons of foundry, and the A. P. Smith Co. inquiry for 600 tons of foundry is still out.

Prices on eastern business seem to be \$16.50 to \$17, Buffalo base, and in the district the quotation is \$18.50, Buffalo, for No. 2 plain, 1.75 to 2.25 per cent silicon.

Prices per gross ton f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25.	\$18.50
No. 2X fdy., sil. 2.25 to 2.75.	19.00
No. 1 fdy., sil. 2.75 to 3.25.	20.00
Malleable, sil. up to 2.25.	19.00
Basic.	17.50
Lake Superior charcoal.	27.28

**Finished Steel.**—Operations of steel mills continue unchanged. Fabricated structural steel and reinforcing steel business is slow.

**Old Material.**—The market is very quiet. One sale of 500 tons of stove plate at \$12.50 just outside Buffalo is reported. It is understood that one of the local mills bought about 2000 tons of No. 1 heavy melting steel to be brought in by boat from the East for about \$14.50, Buffalo. There is almost a total absence of new buying, and the market has not strengthened since last week.

One of the local mills has been buying hydraulic compressed sheets extensively in Detroit at \$11.50, that city. This material will be brought

### Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes.	3.40c.
Soft steel bars.	3.30c.
Reinforcing bars.	2.95c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel.	5.85c.
Black sheets (No. 24).	4.20c.
Galv. sheets (No. 24).	4.85c.
Blue ann'd sheets (No. 10).	3.50c.
Com. wire nails, base per keg.	\$3.20
Black wire, base per 100 lb.	3.50

in by boat within two or three weeks.

Prices per gross ton f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel.	\$14.00 to \$15.00
No. 2 heavy melting scrap.	12.50
Scrap rails.	14.00 to 15.00
Hydraul. comp. sheets.	12.50
Hand bundled sheets.	10.00 to 10.50
Drop forge flashings.	12.50
No. 1 busheling.	13.00 to 13.75
Hvy. steel axle turnings.	13.00 to 13.50
Machine shop turnings.	8.00 to 8.50
No. 1 railroad wrought.	10.50 to 11.00
Acid Open-Hearth Grades:	
Knuckles and couplers.	17.50 to 18.00
Coil and leaf springs.	17.50 to 18.00
Rolled steel wheels.	17.50 to 18.00
Low phos. billet and bloom ends.	17.50 to 18.00
Electric Furnace Grades:	
Short shov. steel turnings.	11.75 to 12.25
Blast Furnace Grades:	
Short mixed borings and turnings.	10.50 to 11.00
Cast iron borings.	10.50 to 11.00
No. 2 busheling.	8.00
Rolling Mill Grades:	
Steel car axles.	16.50 to 17.00
Iron axles.	19.50 to 20.00
Cupola Grades:	
No. 1 machinery cast.	12.50 to 13.00
Stove plate.	12.00 to 12.50
Locomotive grate bars.	10.00 to 10.50
Steel rails, 3 ft. and under.	17.00 to 17.50
Cast iron carwheels.	11.50 to 12.00
Malleable Grades:	
Industrial.	16.00 to 16.50
Railroad.	16.00 to 16.50
Agricultural.	16.00 to 16.50
Special Grades:	
Chemical borings.	11.50 to 12.00

### Gain in British Iron and Steel for March

LONDON, ENGLAND, April 12 (*By Cable*).—Production of pig iron in March was 665,800 gross tons, and that of steel ingots and castings 826,100 tons. Both of these are the largest thus far this year and both exceed the monthly average for 1929.

Comparison of the March output with other periods is given in the following table:

	Pig Iron, Gross Tons	Steel Ingots and Castings, Gross Tons
1913—Av. monthly.	855,000	638,600
1920—Av. monthly.	669,500	755,600
1922—Av. monthly.	408,500	490,100
1923—Av. monthly.	620,000	706,800
1924—Av. monthly.	609,900	685,100
1925—Av. monthly.	519,700	616,400
1926—Av. monthly.	203,500	296,700
1927—Av. monthly.	607,800	758,200
1928—Av. monthly.	550,900	710,400
1929—Av. monthly.	631,600	800,600
1930—January.	650,000	771,100
1930—February.	597,000	776,400
1930—March.	665,800	826,100

### More Steel Shipbuilding Under Way

Steel ships under construction March 31, are reported by Lloyd's Register of Shipping at 3,265,929 tons gross register. This is an increase of 5 per cent from the 3,110,880 tons at the end of 1929. It shows an improvement of more than 3 per cent on the 3,162,000 tons in June, 1914.

Compared with three months ago, gains have been fairly general, Great Britain and Ireland, which account for about one-half the total, having shown an increase of 3.5 per cent, the United States an increase of nearly 24 per cent, and other countries an increase of about 4 per cent. Tonnage under construction in the United States is given as 222,974, compared with 179,062 at the end of December.

Consolidated balance sheet of National Steel Corporation as of Dec. 31, 1929, shows total assets of \$120,828,758, including \$6,855,847 cash on hand. Surplus shows \$43,579,920.



# Non-Ferrous Metal Markets

## Copper Reduced to 14c.— Tin Inactive—Lead Steady —Zinc Lower

NEW YORK, April 15.

**Copper.**—Effective today, Copper Exporters, Inc., reduced the export price from 18.30c. to 14.30c., c.i.f., usual European ports. Automatically the domestic price for electrolytic copper became 14c., delivered in the Connecticut Valley. Thus the long-expected break in copper prices has materialized. That a decline today of £5 per ton in standard copper at London had any effect is denied in some quarters. The cut in price was more drastic than had been expected and is pointed to as a minimum. Sentiment in the export organization is reported to have been unanimous for the change.

There is also a question as to whether the March statistics, which showed an increase in refined copper stocks at the end of the month of 22,897 tons over February, was a factor. Offsetting this was a decline in the rate of production last month to 4099 tons a day against an average rate in 1929 of 4964 tons daily. Both domestic and foreign sales thus far this month are also reported to have been higher than for the corresponding period in any month for the first quarter.

An optimistic view is taken by producers, and it is expected confidently that heavier buying will result. In fact, two or three producers report that, soon after the change was announced, there were large inquiries and that several substantial contracts were negotiated, all for very early shipment. One factor, believed to have influenced the change, is a statement that much of the proposed extensive electrification work about to be undertaken in the country had been delayed or held up by the 18c. price.

Producers of Lake copper are today quoting 14c. to 14.12½c., delivered, and state that inquiries and orders have increased materially. For some days in the tin trade a reduction in copper prices had been predicted, based on the argument that efforts abroad to stabilize rubber, lead, zinc and tin had already failed.

Prices of copper and brass rolled products will be adjusted to lower levels, probably tomorrow.

**Tin.**—Sales have been very light the past week and the market dull.

### THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Apr. 15	Apr. 14	Apr. 12	Apr. 11	Apr. 10	Apr. 9
Lake copper, New York.....	14.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*.....	13.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y. ....	36.37½	36.62½	.....	37.00	36.87½	36.87½
Zinc, East St. Louis.....	4.90	4.92½	4.92½	4.92½	4.92½	4.95
Zinc, New York.....	5.25	5.27½	5.27½	5.27½	5.27½	5.30
Lead, St. Louis.....	5.40	5.40	5.40	5.40	5.40	5.40
Lead, New York.....	5.50	5.50	5.50	5.50	5.50	5.50

\*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

### Rolled Products

#### List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

<b>Sheets—</b>	
High brass .....	23.25c.
Copper, hot rolled.....	26.75c.
Zinc .....	10.00c.
Lead (full sheets).....	9.25c.
<b>Seamless Tubes—</b>	
High brass.....	28.25c.
Copper .....	29.25c.
<b>Rods—</b>	
High brass .....	21.25c.
Naval brass .....	24.00c.
<b>Wire—</b>	
Copper .....	19.87½c.
High brass .....	23.75c.
Copper in Rolls.....	26.75c.
Brass Tubing .....	30.87½c.

### Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide .....	31.30c.
Tubes, base .....	42.00c.
Rolled rods in coils .....	31.00c.

### Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

<b>Sheets—</b>		Base per Lb.
High brass .....	23.25c.	
Copper, hot rolled.....	27.75c.	
Copper, cold rolled, 14 oz. and heavier .....	30.00c.	
Zinc .....	10.75c.	
Lead, wide .....	10.05c.	
<b>Seamless Tubes—</b>		
Brass .....	28.25c.	
Copper .....	29.25c.	
Brass Rods .....	21.25c.	
Brass Tubing .....	31.00c.	

### New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass .....	21.12½c.
Copper, hot rolled, base sizes.....	27.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes.....	30.00c.
<b>Seamless Tubes—</b>	
Brass .....	28.25c.
Copper .....	30.12½c.
Brass Rods .....	18.87½c. to 19.87½c.
Brass Tubing .....	30.87½c.

### New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks .....	10.25c. to 11.00c.
Zinc sheets, open.....	11.25c. to 11.75c.

### Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig .....	38.00c. to 39.00c.
Tin, bar .....	40.00c. to 41.00c.
Copper, Lake .....	15.50c.
Copper, electrolytic .....	15.25c.
Copper, casting .....	15.00c.
Zinc, slab .....	6.25c. to 7.25c.
Lead, American pig.....	6.50c. to 7.00c.
Lead, bar .....	8.00c. to 8.50c.
Antimony, Asiatic .....	10.25c. to 10.75c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure).....	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy .....	24.00c. to 25.00c.
Babbitt metal, commercial grade .....	25.00c. to 35.00c.
Solder, ½ and ½ .....	25.50c. to 26.50c.

### Metals from Cleveland Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig.....	42.25c.
Tin, bar .....	44.25c.
Copper, Lake .....	19.50c.
Copper, electrolytic .....	19.25c.
Copper, casting .....	18.75c.
Zinc, slab .....	7.50c. to 7.75c.
Lead, American pig.....	6.38c. to 6.63c.
Lead, bar .....	8.75c.
Antimony, Asiatic .....	16.00c.
Babbitt metal, medium grade.....	17.50c.
Babbitt metal, high grade.....	44.25c.
Solder, ½ and ½ .....	27.75c.

### Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	15.00c.	16.50c.
Copper, hvy. and wire .....	14.50c.	16.25c.
Copper, light and bottoms .....	12.50c.	14.00c.
Brass, heavy .....	8.00c.	9.25c.
Brass, light .....	6.75c.	7.75c.
Hvy. machine composition .....	11.25c.	12.25c.
No. 1 yel. brass turnings .....	8.75c.	9.25c.
No. 1 red brass or compos. turnings.....	10.50c.	11.75c.
Lead, heavy .....	4.25c.	4.625c.
Lead, tea .....	3.00c.	3.50c.
Zinc .....	2.75c.	3.25c.
Sheet aluminum .....	9.50c.	11.50c.
Cast aluminum .....	8.50c.	10.50c.

Statistics point to large quantities of the metal available. Stocks in London warehouses increased 318 tons last week and stood at 16,471 tons on April 10. Shipments from the East for the first half of the month have been about 4105 tons, which are large and about what have been predicted. Also, there are large quantities of the metal at dock here, pressing for sale. On April 1 official warehouse stocks were 1529 tons and had increased to 2073 tons on April 12.

Prices in London today were a little higher than a week ago with spot standard at £164 10s., future standard at £166 12s. 6d., and spot Straits at £166 15s. The Singapore price today was £167 5s. Spot Straits tin today was quoted 36.37½c., New York, in a dull market.

The foregoing facts seem to point to a possibility of lower prices and heavier buying.

**Lead.**—Prices are quotably unchanged at 5.50c., New York, as the contract price of the leading interest, and at 5.40c., St. Louis, in the outside market. Demand is light and confined to sales of carloads, with a tendency among some sellers not to offer the metal freely. There is some interest in the May position, but sales are confined to April delivery.

**Zinc.**—In the week prices for prime Western have declined. The metal is available at 4.90c., East St. Louis, with some producers holding at 4.92½c. On the surface, demand is light, but considerable business has been put through.

## Railroad Equipment

Business in Small Volume—  
Erie Buys Locomotives

**ORDERS** placed in the past week for 129 cars included 100 for the Cities Service Tank Line. New inquiry continues small, with the Amtorg Trading Corporation asking for 50 air dump cars for Russia, the Tennessee Copper Co. for 10 to 30 tank cars and the National Tube Co. for six 50-ton ore cars. The Erie Railroad has ordered 10 eight-wheel switching locomotives and five extra tenders. Details of the week's business follow:

Erie has ordered 10 eight-wheel switching locomotives and five extra tenders from Baldwin Locomotive Works.

Tennessee Copper Co. is inquiring for 10 to 30 tank cars.

National Tube Co. is inquiring for six 50-ton ore cars.

Amtorg Trading Corporation is inquiring for 50 air dump cars.

Union Pacific System is in the market for 300 steel underframes for flat cars it will build in its own shops.

New York, New Haven & Hartford has ordered 15 coke cars from Standard Steel Car Co.

Northern Pacific will probably place orders this week for 250 stock cars.

Cities Service Tank Line has ordered 100 tank cars from General American Tank Car Corporation.

Inland Lime & Stone Co. has placed

Ore in the Joplin market is still unchanged at \$35, with sales for the week ended April 10 at 2270 tons as against 4370 tons the previous week. Production was up at 8200 tons, with shipments a little over 5000 tons, leaving present stocks at 16,506 tons, or 3100 tons larger than a week ago.

**Antimony.**—The market is quiet, and Chinese metal is quoted at 8c., New York, for spot and 7.87½c. for futures.

**Nickel.**—Wholesale lots of ingot nickel are quoted at 35c. a lb. with shot nickel at 36c. and electrolytic nickel in cathodes at 35c.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c., delivered.

### Non-Ferrous Metals at Chicago

CHICAGO, April 15.—Sales are more numerous and in larger aggregate volume. Prices for copper are off sharply and quotations for tin are higher. Old metals are moving in fair volume.

Prices per lb., in carload lots: Lake copper, 14.50c.; tin, 37.20c.; lead, 5.50c.; zinc, 5.05c.; in less-than-carload lots, antimony, 9c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.25c.; zinc, 2.50c.; pewter, No. 1, 19c.; tin-foil, 21c.; block tin, 26.50c.; aluminum, 9.25c.; all being dealers' prices for less-than-carload lots.

14 dump cars with Koppel Industrial Car & Equipment Co.

Illinois Central has made definite inquiry for 20 suburban cars.

## Reinforcing Steel

Week Has Been Quiet—Awards  
About 4700 Tons

**REINFORCING** steel awards the past week were 4700 tons. The largest letting was 1400 tons for the Houston Terminal Elevator at Houston, Tex. New jobs up for bids were small, totaling only 1400 tons. Awards follow:

CALDWELL, N. J., 240 tons, Mount St. Dominic's Academy, to Joseph T. Ryerson & Son.

WESTCHESTER COUNTY, 350 tons, bridge over Croton Lake, to Carroll-McCreary Co.

NEW YORK, 250 tons, grade separation work for New York Central Railroad at 158th Street, to Carroll-McCreary Co.

BRENTWOOD, N. Y., 730 tons, three buildings for Pilgrim hospital, to Carroll-McCreary Co.

MILWAUKEE, 500 tons, Post Office, to Truscon Steel Co.

STATE OF WISCONSIN, tonnage not given, road work, to an unnamed bidder.

STATE OF INDIANA, 1000 tons, road work, to several bidders.

HOUSTON, TEX., 1400 tons, Houston Terminal Elevator, to Laclede Steel Co.  
ST. LOUIS, 165 tons, public school at Vandeventer and Enright Avenues, to Missouri Rolling Mills Corporation.

### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

ROCKFORD, ILL., 200 tons, Smith Building.  
CHICAGO, 100 tons, Film Exchange building; Paschen Brothers, general contractors.

CHICAGO, 100 tons, Oriental Institute for University of Chicago.

FORT WORTH, TEX., 1000 tons, Texas & Pacific Railway shop buildings.

## To Increase Cold-Rolling Capacity 40,000 Tons

An increase of 40,000 tons a year in the capacity of the cold-rolled strip steel department of the Cuyahoga works, Cleveland, of the American Steel & Wire Co., will be provided by the erection of several additional cold-rolling mills. This addition is the first step in a contemplated large expansion of the company's Cleveland cold-rolled strip steel plant. This plant at present has an annual capacity of 100,000 tons of strip steel. A large building will be erected to house the additional mills and annealing and other equipment.

Contract for two continuous rod mills each of 18 stands for extensions to its Donora works has been placed by the American Steel & Wire Co. with Lewis Foundry & Machine Co., Pittsburgh. The reels will be supplied by the Kilby Mfg. Co., Cleveland.

## American Radiator Buys Murray Corporation

The American Radiator-Standard Sanitary Corporation has bought the Murray Radiator Corporation, Brooklyn, manufacturer of copper radiators. The Murray radiators have been installed in the new Chrysler Building and the New Yorker Hotel in New York.

## Ingalls Iron Works Co. Buys Verona, Pa., Company

The Ingalls Iron Works Co., Birmingham, has purchased the property of the Pennsylvania Fabrication Co., Verona, Pa., formerly the Bollinger-Andrews Construction Co. The Verona plant will be greatly improved, as the Ingalls company expects to spend \$1,000,000 in betterments over the next two years. The old Bollinger-Andrews company formerly was engaged in fabrication of structural steel and in steel shape and plate specialty work. Under the new management the nature of the business will not be changed. The new company will begin operating the plant within the next 30 days.



# Fabricated Structural Steel

## Awards of 29,000 Tons Show Slight Decline—Pittsburgh Building Takes 11,430 Tons—Inquiries for 38,000 Tons

**A**WARDS of structural steel totaling about 29,000 tons were slightly smaller than in the previous week, with 33,000 tons. The largest award was 11,430 tons for a building in Pittsburgh, and other sizable contracts included 2800 tons for transmission towers at Louisville, Ky., 2500 tons for a subway in Philadelphia and 1370 tons for oil tanks in Cleveland.

New projects totaling close to 38,000 tons included 8500 tons for a building in Dayton, Ohio, for the Dayton Terminal Co., 7000 tons for a public utility office building in Kansas City, Mo., and 3200 tons for a subway section in New York. Awards follow:

STATE OF MAINE, 140 tons, bridges at Fryeburg, South Bristol, Passadumkeag and Great Works, to McClintic-Marshall Co.

CAMBRIDGE, MASS., 175 tons, dormitory for Massachusetts Institute of Technology, to Boston Structural Co.

EVERETT, MASS., 170 tons, Boston Varnish Co. plant, to New England Structural Co.

WESTERLY, R. I., 150 tons, high school, to Providence Steel & Iron Co.

NEW YORK, 1000 tons, school No. 144 in Borough of Queens, to Easton Structural Steel Co.

NEW YORK, 300 tons, vocational school for College of City of New York, reported to Lehigh Structural Steel Co.

PHILADELPHIA, 2500 tons, Ridge Avenue subway, to American Bridge Co.

PHILADELPHIA, 230 tons, freight building for Reading Railroad, to Montgomery Iron & Steel Co.

RELIUS, N. Y., 100 tons, bridge over New York Central Railroad, to Phoenix Bridge Co.

SCRANTON, PA., 940 tons, Post Office, to Lehigh Structural Steel Co.

TRAFFORD CITY, PA., 100 tons, plant building for Westinghouse Electric & Mfg. Co., to Jones & Laughlin Steel Corporation.

PITTSBURGH, 11,430 tons, Gulf Building, to McClintic-Marshall Co.

DETROIT, 130 tons, telegraph bridge, River Rouge, to Massillon Structural Steel Co.

MICHIGAN CITY, MICH., 300 tons, car shops for Chicago, South Shore & South Bend, to Duffin Iron Co.

CLEVELAND, 1370 tons, tanks to be built in Cleveland and Buffalo for Allied Oil Co., to McClintic-Marshall Co.

CINCINNATI, 350 tons, five maneuver barges for United States Engineer, to American Bridge Co.

LOUISVILLE, KY., 2800 tons, transmission towers for Louisville Gas & Electric Co.; 2450 tons to Bates Expanded Truss Co., and 350 tons to Louisville Bridge Co.

CHARLOTTE, N. C., 190 tons, underpass, to Ingalls Iron Works.

MORGAN COUNTY, TENN., 300 tons, bridge, to Virginia Bridge & Iron Co.

BATON ROUGE, LA., 200 tons, for Standard Oil Co., to Ingalls Iron Works.

PEORIA, ILL., 500 tons, assembly building for Caterpillar Tractor Co., to Austin Co.

OCONTO, WIS., 100 tons, Little River bridge, to Worden-Allen Co.

MILWAUKEE, 2300 tons, Post Office, to McClintic-Marshall Co.; previously reported as 850 tons.

MOSCOW, IOWA, 550 tons, highway bridge, to Clinton Bridge Co., Clinton, Iowa.

TOPEKA, MINN., 550 tons, highway bridge, to American Bridge Co.

MILWAUKEE ROAD, 400 tons, bridge, to American Bridge Co.

SANTA FE RAILROAD, 290 tons, school and fire department buildings, to Capital Iron Works.

ST. LOUIS, 500 tons, Herbert Hadley Vocational School, to Mississippi Valley Structural Steel Co.

BAGNELL, MO., 600 tons, power station for Stone & Webster, Inc., to Mississippi Valley Structural Steel Co.

TUCSON, ARIZ., 120 tons, including 60 tons of steel joists, school, to El Paso Bridge Co.

SOUTHGATE, CAL., 100 tons, plates and shapes, 1,500,000-gal. tank and tower, to Chicago Bridge & Iron Works.

LOS ANGELES, 150 tons, Muscat Street grade separation for Pacific Electric Railway, to Consolidated Steel Corporation.

SAN FRANCISCO, 150 tons, viaduct over Steiner Creek for Southern Pacific Co., to Dyer Brothers.

MARE ISLAND, CAL., 250 tons, three hammerhead cranes for Government; sub-contract for shapes to Dyer Brothers.

SAN FRANCISCO, 300 tons, plates and shapes, ship loading platform for State Harbor Commission, to Herrick Iron Works.

NYSSA, ORE., 105 tons, Owyhee project, United States Bureau of Reclamation, to unnamed bidder.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

NEW YORK, 3000 tons, junior high school in Borough of Queens.

NEW YORK, 1200 tons, store and loft building, 29 to 31 East Forty-seventh Street.

BROOKLYN, 3200 tons, subway section No. 4, route 103; bids open May 7.

STATE OF NEW YORK, 300 tons, highway bridges.

STATE OF NEW JERSEY, 400 tons, highway bridges.

PHILADELPHIA, 6000 tons, office building; bids in.

PHILADELPHIA, 1700 tons, viaduct at Chestnut and Thirtieth Streets; bids open April 17.

DAYTON, OHIO, 8500 tons, Dayton Terminal Co. developments; bids taken.

YOUNGSTOWN, 500 tons, repairing Smith Street bridge.

CLEVELAND, 300 tons, arch supports for Fulton Road bridge.

WINNETKA, ILL., 200 tons, Parish building. CHICAGO, tonnage being estimated, administration building for Chicago World's Fair.

BAGNELL, MO., 350 tons, crane runways for Stone & Webster, Inc.

KANSAS CITY, MO., 7000 tons, building for Kansas City Power & Light Co.

TULSA, OKLA., 900 tons, Union Station. BIG FOUR RAILROAD, 450 tons, shop additions.

EVERETT, WASH., 365 tons, plates, 30-in. welded steel pipe line; bids April 14.

SAN FRANCISCO, 1800 tons, plates, welded steel pipe line, California-Hawaiian Sugar Co.; bids opened.

SAN FRANCISCO, 1000 tons, chemical plant; bids being taken.

OAKLAND, CAL., 450 tons, store for Magnin; bids April 15.

## To Make Continuous Strip for Sheets at Fairfield

Formal announcement of the plans of the Tennessee Coal, Iron & Railroad Co., Birmingham, for expansions and improvements at its Fairfield operations, mentioned in these columns last week, as issued by President H. C. Ryding, is as follows:

"The finance committee of the United States Steel Corporation has authorized the following improvements to the plants of the Tennessee Coal, Iron & Railroad Co., at Fairfield, Ala.:

"Construction of one additional 150-ton open-hearth furnace; alterations to the present 45-in. blooming mill, including the construction of an additional soaking pit; installation of a rolling mill on which to produce strips for rolling into sheets and alterations and additions to the present sheet mill, materially increasing the capacity of this department."

## Prices and Unfiled Orders of Non-Ferrous Ingots

CHICAGO, April 14.—The Non-Ferrous Ingot Metal Institute reports the average prices per pound received by its membership on commercial grades of the six principal mixtures of ingot brass during the 28-day period ended March 28. As there are, as yet, no generally accepted specifications for ingot brass, it must be understood that each item listed below is a compilation representing numerous sales of metal known to the trade by the designation shown, but each item in reality including many variations in formulas. Until the program of standardizing the principal specifications, now progressing in cooperation with the American Society for Testing Materials, is completed, the following specifications will be understood to refer to commercial grades:

	Cents
Commercial 80-10-10 (1 per cent impurities) .....	16.535
Commercial 78 per cent metal .....	14.868
Commercial 81 per cent metal .....	15.075
Commercial 83 per cent metal .....	15.300
Commercial 85-5-5-5 .....	15.538
Commercial No. 1 yellow brass ingot .....	12.300

On April 1, unfilled orders for brass and bronze ingots and billets on the books of the members of the institute amounted to a total of 7537 net tons. This compares with 8821 tons on March 1, with 9630 tons on Feb. 1 and with 9578 tons on Jan. 1.

## Company Changes

Stockholders of the Galesburg Coulter Disc Co., a subsidiary of Borg-Warner Corporation, have voted to change the name of the company to Ingersoll Steel & Disc Co. A manufacturing plant is located at Galesburg, Ill., and rolling mills at New Castle, Ind., and West Pullman, Ill. The business now to be known as the Ingersoll Steel & Disc Co. was founded in 1885 by Stephen A. Ingersoll of Galesburg, Ill.

Trottnor Steel Co., 221 East 131st Street, Cleveland, has been reorganized as the Lake Erie Steel Corporation. Harry Trottnor, president of the old company, has disposed of his interest and has been succeeded as president by M. M. Weiner, formerly vice-president, who is also treasurer. H. S. Gottfried, formerly secretary, is now vice-president and secretary. Irving Roth has been elected a director to succeed Mr. Trottnor. The company manufactures blanks for various stampings both from new stock and from scrap.

Seneca Iron & Steel Co., Buffalo, has moved its New York sales office from the Woolworth Building to the new Chrysler Building, room 3314. F. B. Keith is district sales manager.

Pierson Son, Inc., dealer in iron and steel for 150 years and located at 29 Broadway, New York, for the past 35 years, is moving its general office to the Park Murray Building, 9 Park Place, New York.

United States Gypsum Co. has purchased the Northwestern Expanded Metal Co., which has plants at Chicago and Jeannette, Pa.

Lincoln Electric Co. Cleveland, manufacturer of motors and welding machines, has opened sales offices in Saginaw, Mich., Fort Wayne, Ind., and Oil City, Pa. The Saginaw office is at 338 Barnard Street and is in charge of J. E. Luter. The Fort Wayne office is at 225 East Columbia Street and is in charge of D. H.

Carver. The Oil City office is in charge of E. D. Anderson.

A Chicago office has been opened by the Sandvik Conveyor Mfg. Co., Newark, N. J., at 180 North Michigan Avenue. This is in charge of Morton Fries. It is devoted to materials handling machinery of the belt conveyor type, with particular reference to steel belts.

## Industrial Items

Link-Belt Co., Chicago, announces the appointment of the following agents who will handle their complete line of crawler cranes, shovels, draglines and locomotive cranes: P. L. Tippet, Rhodes Building, Atlanta, Ga.; Joseph C. Fiorello Co., Larkin Terminal Building, Buffalo; Bacon-Hibbard-Eichman, Inc., 917 Central Avenue, Cleveland.

Joseph Schonthal Co., Columbus, Ohio, has bought from the Michigan Electric Shares Corporation all of the interurban electric railway equipment formerly owned by the Michigan Electric Railway Co., between Jackson and Battle Creek, Mich., with the exception of real estate, right-of-way and telephone lines. Forty-five miles of 70 lb. rails are included. The Schonthal company will dismantle the property and sell the equipment.

Fletcher-Thompson, Inc., engineer and architect, Bridgeport, Conn., and Newark, N. J., has become associated with Samuel M. Green Co. of Springfield, Mass., and the Charles H. Moores Co., Inc., New York. All of these organizations have specialized in the designing of industrial plants. Offices will be maintained by the combined organization in New York, Newark, N. J., Bridgeport, Conn., and Springfield, Mass.

The Fulton Iron Works, St. Louis, will manufacture the Fulton-Gill axial-flow pump under United States patents. The pump is primarily intended to serve the low-lift pumping field by handling large quantities of water or other liquids to moderate levels.

## Association Activities

Illinois Manufacturers' Association is organizing a good will tour to Europe. This tour is being divided into three sections, which will sail from New York June 7 on the Laconia. Tour No. 1 will take in England, Belgium, Holland and France. Tour No. 2 will include England, Holland, Belgium, Germany, Switzerland and France, and Tour No. 3 will provide for visitation in England, Holland, Belgium, Germany, Switzerland, Italy and France.

At the annual meeting of the Cleveland branch, National Metal Trades Association, March 21, the following officers were elected for the ensuing year: President, George E. Randles, president, Foote-Burt Co.; vice-president, E. J. Stahl, vice-president, Baker-Raulang Co.; treasurer, W. C. Sayle, vice-president and general manager, Cleveland Punch & Shear Works Co.

American Trade Association Executives, 644 Drexel Building, Philadelphia, will announce at their April 30 meeting in Washington the winner of the award for "the outstanding achievement of a trade association in relation to distinguished service rendered by it to the industry it represents, to industrial development at large, and to the public." Secretary of Commerce Lamont is chairman of the jury of awards.

Appointment of a committee to co-operate in the publication of a new edition of "Who's Who in Engineering" has been announced by the American Engineering Council. According to L. W. Wallace, executive secretary of the Council, the function of the committee "is to provide such advice on the qualifications of engineers as will enable the publishers to issue a work which shall be authoritative."

## Technical Notes

"Treatise on Phosphorus in Foundry Pig Iron" is the title of an eight-page leaflet written by Y. A. Dyer, consulting metallurgist, Birmingham, and distributed with the compliments of the Sloss-Sheffield Steel & Iron Co., Birmingham.

A treatise on salvaging of material in the oil industry by C. P. Bowie has been published by the Bureau of Mines, Department of Commerce, as Technical Paper No. 461. The author concludes with the statement that efficiently operated salvage departments pay large dividends to the oil companies.

### Canadian Production of Pig Iron and Steel\*

(Gross Tons)

	February, 1930	January, 1930	February, 1929
Pig iron made.....	70,600	87,079	93,939
do. two months.....	157,679	.....	181,703
Ferroalloys made.....	4,821	6,943	.....
do. two months.....	11,764	.....	12,265
Steel ingots made.....	99,964	108,644	.....
do. two months.....	208,608	.....	223,033
Steel castings made.....	6,648	6,556	.....
do. two months.....	13,024	.....	10,672
Total steel made.....	106,612	115,200	117,445
do. two months.....	221,812	.....	233,705
Ore charged into blast furnaces.....	127,223	158,816	.....
do. pounds per ton of pig iron.....	4,039	4,085	.....

\*Dominion Bureau of Statistics, Ottawa.



# Dullness Prevails in European Trade

Approaching Holiday Slows British Iron and Steel Trade—Tin Plate an Active Item—Continental Cartels Cause Uncertainty

(By Cable)

LONDON, ENGLAND, April 14.

THE iron and steel market is quiet on approach of the Easter holidays. Cleveland pig iron consumers have now covered their immediate requirements and are not considering forward commitments. Stocks of pig iron have diminished, and furnaces are better situated for the present.

Export sales of pig iron are still negligible, but inquiry from Continental users is improving. Hematite iron continues dull and stocks are large, with the result that prices are well below cost.

Finished iron and steel markets are dull, especially for export, and domestic demand has receded as new shipbuilding is limited. Consequently, mills are in need of heavy steel orders and are operating irregularly.

British exports of pig iron in March were 33,000 tons, of which the United States was sent 2000 tons. Total iron and steel exports were 338,000 tons.

Continental business here is decidedly inactive, as consumers of semi-finished material are not in need of supplies while export demand continues small. Merchants are still uncertain of their position, with prices controlled by the Continental Steel Cartel and are hesitant to operate. Concessions on certain products of 1s. to 2s. (24c. to 48c.) per ton are reported offered by European mills.

Tin plate is active, and mills are well sold ahead. Consumers have bought for May to October delivery, and prices are firm. Increased tin plate consumption is reflected in the March exports, which totaled more than 50,000 tons of tin plate. The

general outlook for tin plate is considered favorable.

Galvanized sheet prices are unchanged, but demand is small, especially from India, and works are in need of orders. Black sheets are quiet and Far Eastern demand is limited.

Sir W. G. Armstrong, Whitworth, iron founders, has been formed with capital of £130,000 (\$631,800), in £1 (\$4.86) shares to take over from Sir W. G. Armstrong, Whitworth & Co., securities and the foundry business at the Close works, Gateshead.

German pig iron output in March was 1,007,500 metric tons.

still using ore and fuel bought at higher prices. Now that these supplies are exhausted and contracts are being renewed at lower terms, prices of pig iron have been reduced. As a result, there has been increased activity in the market, and a number of substantial orders for both domestic and export shipment have been placed.

So far, pig iron producers in other districts have not followed the lead of the Cleveland area. Most of the business has been between the producers and users, with little passing through the hands of merchants.

## German Tube Mills Lack Orders

HAMBURG, GERMANY, April 1.—Orders allocated by the German Tube Syndicate to its members in January and February represented about 35 per cent of capacity of the mills. In March there was a slight improvement, with orders representing 38 to 40 per cent of capacity. Certain tube mills have suspended operation, and practically all others in Germany are operating on curtailed schedules.

## British Pig Iron Prices Reduced

LONDON, ENGLAND, April 1.—The price of Cleveland pig iron has finally been reduced. In spite of repeated reductions this year in fuel and ore prices, pig iron producers had not passed them on to consumers. This was largely because furnaces were

## Japan Rolls Electrical Sheets

YOKOHAMA, JAPAN, March 17.—The first electrical sheets to be made by the Government Steel Works are expected to be delivered by the end of this month. Only about 25 tons is now being rolled and the output will probably not exceed 50 tons a month for some time.

## Japan's Wire Rod Imports from Germany Large

YOKOHAMA, JAPAN, March 17.—February imports of wire rods through the ports of Kobe, Osaka and Yokohama totaled 12,648 tons, according to preliminary figures. Of this amount, 4343 tons came from Germany, 978 tons from the United States, 590 tons from Belgium, 300 tons from Canada, 109 tons from Austria, and 6324 tons from other countries. The total was 180 tons less than in January.

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at \$4.8665 (par)

### British Prices f.o.b. United Kingdom Ports

Ferromanganese, export.	£10 15s. to £11 15s.	\$52.30 to \$57.17
Billets, open-hearth.	6 0 to 6 10	29.20 to 31.63
Black sheets, Japanese specifications	12 5	59.61
Tin plate, per base box.	0 18½ to 0 18½	4.46 to 4.50
Steel bars, open-hearth.	8 0 to 8 10	1.74 to 1.85
Beams, open-hearth.	7 7½ to 7 17½	1.60 to 1.71
Channels, open-hearth.	7 12½ to 8 12½	1.66 to 1.87
Angles, open-hearth.	7 7½ to 7 17½	1.60 to 1.71
Black sheets, No. 24 gage	9 15 to 10 0	2.12 to 2.17
Galvanized sheets, No. 24 gage	11 17½ to 12 5	2.57 to 2.60

### Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£3 3½s. to £3 4½s.	\$15.44 to \$15.69
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Billets, Thomas	4 13 to 4 14	22.63 to 22.87
Wire rods, low C., No. 5 B.W.G.	6 2 to 6 4	29.69 to 30.19
Rails, light	6 0	29.20
Steel bars, merchant.	5 7½ to 5 7½	1.18
Steel bars, deformed.	5 6½ to 5 7½	1.17 to 1.18
Beams, Thomas, British standard	5 3 to 5 6	1.12 to 1.17
Channels, Thomas, American sections	5 12 to 5 14	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ¾-in. thick	5 6 to 5 7½	1.17 to 1.18
Angles, Thomas, 3-in.	5 7½	1.18
Black sheets, No. 31 gage, Japanese	12 1 to 12 3	2.66 to 2.68
Hoop and strip steel over 6-in. base.	5 17½ to 6 10	1.28 to 1.42
Wire, plain, No. 8 gage.	6 10	1.42
Wire, barbed, 4-pt. No. 12 B.W.G.	10 10 to 6 15	2.28 to \$1.47 a keg
Wire nails, base.	6 15	

# Machinery Markets and News of the Works

## Machine Tool Trade Steady

No Upturn Yet in Sight—Unfilled Orders at Lowest Point Since Summer of 1928

NO uptrend in machine tool orders is reported, but the volume of business in leading districts is at a steady rate. Indications point to the possibility that present conditions may last for two or three months longer. The machine tool industry itself looks for no decided improvement before midsummer or possibly September.

Shipments of machine tools in March, according to the monthly report of the National Machine Tool Builders' Association, were only slightly above those of February and were considerably below the volume of the same month in 1929. Unfilled orders declined to the lowest point since the summer of 1928. Present unfilled orders represent only two months' shipments at the March rate.

Net orders of the industry, as computed by the association, were at 178.8 and shipments were 226.6, the base figure 100 representing the average monthly shipments for 1922, 1923 and 1924. The three months' moving average of orders at the end of March

was 177.8, as compared with 172.6 at the end of February, a slight gain but scarcely enough to indicate a definite uptrend, although the downswing which began in May of last year apparently has been checked.

Of special interest in the market in the past week were purchases by the Nash Motors Co. for its Milwaukee plant and the possibility that further purchases may be made soon for the Racine, Wis., plant. Automobile buying of machine tools has not been large lately. However, some companies in the automobile field bought a good many used tools last week at an auction sale of the equipment of the F. B. Stearns Co., Cleveland. About 500 tools were disposed of.

Railroad buying is a fairly active feature of the Chicago market, although railroad purchases as a whole are not of striking importance.

A feature of all markets is the continued flow of inquiries. Sales constitute only a small percentage of the equipment on which quotations are being made.

## New York

NEW YORK, April 15.—Aside from one order for about \$50,000 worth of machine tools, the local market showed no marked tendency toward improvement in the past week. Most of the current business consists of orders for single tools, and the operators of small or medium-sized shops are more conspicuous among the buyers than the large companies. Several of the most important companies in this territory have machine tool programs in view and have, in many instances, received quotations on the equipment they contemplate buying, but their policy on capital expenditures is still one of hesitancy.

Diamond T Motor Car Co., 4517 West Twenty-sixth Street, Chicago, manufacturer of motor trucks, has leased block of property at Long Island City, including building on site, with 45,000 sq. ft. floor

space, recently taken over under another lease. Plans are in progress for one-story addition, totaling 40,000 sq. ft. floor space, to cost about \$100,000 with equipment. Company will develop property for main Eastern works and distributing plant. Thomas L. Huxley, vice-president and general manager in Eastern territory, is in charge. Alfred H. Eccles, 29-28 Hunter Avenue, Long Island City, is architect.

Southern Kraft Corporation, operated by International Paper Co., 100 East Forty-second Street, New York, has acquired property at Panama City, Fla., as site for new mill for production of kraft paper stocks, initial unit to cost over \$5,000,000 with machinery. Project will include power house and machine shop. Major J. T. Friend is vice-president of Southern company.

Board of Education, Park Avenue and Fifty-ninth Street, New York, has authorized construction of four industrial high schools in connection with 1930 school expansion program, including boys' voca-

tional school in Bronx to cost \$1,660,000; a similar continuation school in Bronx to cost \$1,100,000; boys' vocational school in Brooklyn to cost \$1,660,000, and continuation vocational school on Staten Island to cost \$1,100,000. W. C. Martin, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect for board.

American Radiator & Standard Sanitary Corporation, 40 West Fortieth Street, New York, has purchased Murray Radiator Corporation, 80 Lexington Avenue, manufacturer of copper radiators for commercial building service, for \$5,000,000 and will consolidate. Murray radiator units will be manufactured as heretofore; Thomas E. Murray, Jr., heretofore head of acquired organization, will continue with purchasing company.

New York Power & Light Corporation, State Street, Albany, N. Y., is planning hydroelectric generating plant on Hudson River, near Hadley, N. Y., to cost over \$3,000,000 with power dam and transmission lines. Company is planning to rebuild part of power plant at Glen Falls, N. Y., destroyed by fire April 9.

Pennsylvania Railroad Co., Pennsylvania Terminal, New York, has filed plans for new steel pier on Hudson River, near Exchange Place, Jersey City, N. J., two-stories, 160 ft. wide and 905 ft. high, to cost \$2,000,000 with traveling crane for loading, conveying machinery and other equipment. Unit will be known as Pier F, and will be first of three such structures to be built.

American Potash & Chemical Corporation, Woolworth Building, New York, will have plans drawn by United Engineers & Constructors, Inc., 112 North Broad Street, Philadelphia, engineer, for addition to potash and borax plant at Trona, San Bernardino County, Cal., including new power plant, to cost over \$3,500,000 with machinery.

Emil Prazak, 508 Monroe Avenue, Elizabeth, N. J., has filed plans for a two-story machine shop. William Clifford, 1177 East Grand Street, is architect.

General Alloy Co., 188 New Jersey Railroad Avenue, Newark, is considering early call for bids for two-story factory with boiler plant, to cost about \$45,000 with equipment. Paul B. West, 24 Commerce Street, is architect.

National Oil Products Co., Essex Street, Harrison, N. J., has asked bids on general contract for a four-story and basement addition, 60 x 85 ft., to cost over \$80,000 with equipment. Bishop & Scudder, 9 Clinton Street, Newark, are architects and engineers.

Charles Shilowitz, Journal Square, Jersey City, N. J., architect, has asked bids on general contract for an eight-story automobile service and garage building, 130 x 225 ft., to cost over \$300,000.

United Color & Pigment Co., Evergreen Avenue, Newark, has plans for a one-story addition, 42 x 60 ft., for grinding and other mechanical service, to cost about \$25,000 with equipment. Robert Bolton, 45 Branford Place, is architect.



## Buffalo

**B**UFFALO, April 14.—Jewell Steel & Malleable Co., 373 Hertel Avenue, Buffalo, has filed plans for two one-story additions for storage and distribution in foundry department.

O. D. May Mfg. Co., 31 Charles Street, Buffalo, manufacturer of butchers' equipment and supplies, has leased two-story factory at Lower Terrace and Henry Street for new new plant and will remove present works occupying part of former Curtiss aircraft plant on North Elmwood Avenue to new location and install additional equipment.

Corning Glass Works, Corning, N. Y., manufacturer of baking glassware, has awarded general contract to Rust Engineering Co., 606 Grant Street, Pittsburgh, for one-story addition, totaling about 25,000 sq. ft. floor space, including improvements in present works, to cost over \$100,000 with equipment.

Bronsteel Products, Inc., Buffalo, has been formed with capital of 200 shares of stock, no par value, to manufacture steel furniture specialties, and will take over and expand Bronsteel Equipment Co., 505 Delaware Avenue. James M. O'Neill, Jr., 81 Monticello Avenue, is interested in new organization.

All-American Mohawk Corporation, 4201 Belmont Avenue, Chicago, manufacturer of radio equipment, will remove plant to North Tonawanda, N. Y., where it will occupy part of factory of Rudolph Wurlitzer Co., manufacturer of pipe organs, etc. Production will be increased at new location. Sales department will be continued at Chicago.

James Wharmby, 114 Ridge Road, Rochester, N. Y., and associates have organized Flicker Signal Co., Inc., with capital of 6000 shares of stock, no par value, and will operate local plant for manufacture of electric automatic signal lights and devices. William H. Robinson, 204 Winbourne Road, is interested in new organization.

General Electric Co., Schenectady, N. Y., is arranging for a reorganization of Walker Dishwashing Corporation, 246 Walton Street, Syracuse, N. Y., manufacturer of electric-operated dishwashing machines, following recent purchase of controlling interest, and will increase production.

Buffalo office of Henry Prentiss & Co., Inc., New York, machine tools, has been moved to 1452 Hertel Avenue.

## Philadelphia

**P**HILADELPHIA, April 14.—Standard Oil Co. of Pennsylvania, Ledger Building, Philadelphia, has filed plans for a new compounding, storage and distributing plant at Pennypacker Avenue and Schuylkill River, to cost \$126,000 with equipment.

Grinnell Co., Inc., Providence, R. I., manufacturer of fire extinguishers, sprinkler systems, etc., has awarded general contract to United Engineers & Constructors, Inc., 211 North Broad Street, Philadelphia, for new factory branch and distributing plant at Philadelphia, to cost about \$150,000 with equipment. Philadelphia offices are in Commercial Trust Building.

City Council, Philadelphia, has closed negotiations with United States Shipping Board for purchase of Hog Island Shipyard for \$3,000,000, and under direction of Public Works Department will develop

site as municipal airport and kindred industrial service. Tract consists of 946 acres, of which 307 acres will be used for airport, including hangars, repair and reconditioning shops and other field units; 569 acres will be developed for a marine and rail terminal, with storage and distributing buildings provided with cranes, conveying and loading and other mechanical-handling facilities; 70 acres will be employed for establishment of seaplane base, with hangars, shops, etc. Entire project will cost about \$6,600,000 including equipment. It is planned to develop part of tract for leasing to industrial interests.

W. E. S. Dyer, Land Title Building, Philadelphia, consulting engineer and architect, has plans for new works at New Brunswick, N. J., to manufacture wire products, to cost about \$1,000,000 with equipment. Company name is temporarily withheld.

West Philadelphia Stock Yards Co., Thirtieth Street, Philadelphia, has revised plans for a six-story meat-packing plant to cost about \$1,000,000, including refrigerating machinery, conveying, elevating and other equipment. C. B. Comstock, 122 East Forty-second Street, New York, is architect and engineer.

Barbour Brothers, Marion Street and Pennsylvania Railroad, Trenton, N. J., iron and steel products, have begun construction of one-story addition, 72 x 143 ft., for steel fabricating shop, to cost about \$45,000 with equipment. Daniel A. Pulone, 249 Hamilton Avenue, is architect.

State Board of Education, State House, Trenton, N. J., has revised plans for two-story power plant, 48 x 58 ft., on Lake Boulevard, Ewing Township, and plans early call for new bids on general contract. Guilbert & Betelle, 20 Branford Place, Newark, N. J., are architects.

Lower Paxton Township School Board, Linglestown, Pa., plans early call for bids for one-story vocational training school, to cost about \$60,000. Kast & Kelker, 222 Market Street, Harrisburg, Pa., are architects.

## New England

**B**OSTON, April 14.—Machine tool dealers report business as virtually at a standstill. Prospects which a week ago gave indication of closing apparently are not yet ready to buy. New inquiries are light. Prompt or nearby delivery can now be made on a majority of equipment built in New England.

Sales of small tools aggregate fairly large each week, although individual orders are small.

United Electric Light Co., Springfield, Mass., closed bids last week on a one-story substation, 80 x 150 ft., to cost \$300,000 with equipment.

C. B. Cottrell's Sons, Westerly, R. I., printing presses, has started work on a two-story assembling plant. Lifting and conveying equipment will be bought.

Larkin & Carey Realty Co., New Haven, Conn., is about to start work on a one-story plant, 90 x 200 ft., for Crawford Oven Co.

Brockton Ice & Coal Co., Brockton, Mass., contemplates building a wood-working and blacksmith shop and will make other improvements.

City of Keene, N. H., has appropriated fund for a two-story and basement school addition, 36 x 72 ft., to contain manual training shops.

Lux Clock Co., Waterbury, Conn., has plans for four-story addition, 32 x 80 ft., to cost over \$75,000 with equipment. Thomas M. Freney and Henry T. Moeckle, Waterbury, are associate architects.

International Silver Co., State Street, Meriden, Conn., has plans for a one-story addition, 40 x 300 ft., to cost close to \$75,000 with equipment.

United States Rubber Co., Providence, R. I., is arranging for concentration of rubber tile flooring and rubber roll manufacture at local plant, and will equip two new factory units recently completed for such branches of hard rubber production. Present such factories at Chicago and Chelsea, Mass., will be removed to Providence. Headquarters are at Broadway and Fifty-eighth Street, New York.

Board of Education, Newton, Mass., will install vocational training department in new South Side junior high school on 11-acre tract at Rowena and Hereward Roads, including metal-working and wood-working shops, to cost over \$700,000, for which plans are being drawn by Henry & Richmond, 12 West Street, Boston, architects.

W. D. Cashin Co., 35 Hartford Street, Boston, manufacturer of boilers, tanks, etc., has plans for a one-story addition to cost about \$45,000 with equipment.

City Ice & Fuel Co., 6611 Euclid Avenue, Cleveland, is planning early construction of new ice-manufacturing plant at St. Albans, Vt., to cost over \$175,000 with machinery.

General Radio Co., 30 State Street, Cambridge, Mass., manufacturer of radio equipment and supplies, has awarded general contract to W. M. Bailey Co., 88 Broad Street, Boston, for four-story and basement addition, 50 x 100 ft., with extension, 20 x 24 ft., to cost about \$100,000 with equipment. Lockwood Greene Engineers, Inc., 24 Federal Street, Boston, is architect and engineer.

Hartford Clamp Co., Park Avenue, East Hartford, Conn., has awarded general contract to Sena Brothers, 737 Wethersfield Avenue, for one-story addition, 30 x 50 ft., to cost about \$20,000 with equipment.

## Pittsburgh

**P**ITTSBURGH, April 14.—The machine tool business in this district continues to show improvement, in both new inquiries and sales. Orders are still principally for single tools, but the total volume is satisfactory to most dealers. Sellers are particularly pleased with the way a number of buyers are releasing orders on equipment which has been held up for several months. The Westinghouse Electric & Mfg. Co. has been buying tools in the last week or two, after a lapse of several weeks, and other large industrial plants in the district have fair-sized inquiries before the trade.

Railroad buying is limited and largely disappointing. The Baltimore & Ohio is not expected to make any important purchases until after the railroad equipment builders' exhibition in Atlantic City in June, and other roads may also delay buying until that time. The Pennsylvania is planning construction of a large foundry at Altoona, Pa.

Formation of Bendix-Westinghouse Automotive Air Brake Co. was announced on April 11, following first meeting of directors of new company. Production will be carried on at Westinghouse Air Brake plant at Wilmerding, Pa. New company

# Machinery Markets and News of the Works

## Machine Tool Trade Steady

No Upturn Yet in Sight—Unfilled Orders at Lowest Point Since Summer of 1928

NO uptrend in machine tool orders is reported, but the volume of business in leading districts is at a steady rate. Indications point to the possibility that present conditions may last for two or three months longer. The machine tool industry itself looks for no decided improvement before midsummer or possibly September.

Shipments of machine tools in March, according to the monthly report of the National Machine Tool Builders' Association, were only slightly above those of February and were considerably below the volume of the same month in 1929. Unfilled orders declined to the lowest point since the summer of 1928. Present unfilled orders represent only two months' shipments at the March rate.

Net orders of the industry, as computed by the association, were at 178.8 and shipments were 226.6, the base figure 100 representing the average monthly shipments for 1922, 1923 and 1924. The three months' moving average of orders at the end of March

was 177.8, as compared with 172.6 at the end of February, a slight gain but scarcely enough to indicate a definite uptrend, although the downswing which began in May of last year apparently has been checked.

Of special interest in the market in the past week were purchases by the Nash Motors Co. for its Milwaukee plant and the possibility that further purchases may be made soon for the Racine, Wis., plant. Automobile buying of machine tools has not been large lately. However, some companies in the automobile field bought a good many used tools last week at an auction sale of the equipment of the F. B. Stearns Co., Cleveland. About 500 tools were disposed of.

Railroad buying is a fairly active feature of the Chicago market, although railroad purchases as a whole are not of striking importance.

A feature of all markets is the continued flow of inquiries. Sales constitute only a small percentage of the equipment on which quotations are being made.

## New York

NEW YORK, April 15.—Aside from one order for about \$50,000 worth of machine tools, the local market showed no marked tendency toward improvement in the past week. Most of the current business consists of orders for single tools, and the operators of small or medium-sized shops are more conspicuous among the buyers than the large companies. Several of the most important companies in this territory have machine tool programs in view and have, in many instances, received quotations on the equipment they contemplate buying, but their policy on capital expenditures is still one of hesitancy.

Diamond T Motor Car Co., 4517 West Twenty-sixth Street, Chicago, manufacturer of motor trucks, has leased block of property at Long Island City, including building on site, with 45,000 sq. ft. floor

space, recently taken over under another lease. Plans are in progress for one-story addition, totaling 40,000 sq. ft. floor space, to cost about \$100,000 with equipment. Company will develop property for main Eastern works and distributing plant. Thomas L. Huxley, vice-president and general manager in Eastern territory, is in charge. Alfred H. Eccles, 29-28 Hunter Avenue, Long Island City, is architect.

Southern Kraft Corporation, operated by International Paper Co., 100 East Forty-second Street, New York, has acquired property at Panama City, Fla., as site for new mill for production of kraft paper stocks, initial unit to cost over \$5,000,000 with machinery. Project will include power house and machine shop. Major J. T. Friend is vice-president of Southern company.

Board of Education, Park Avenue and Fifty-ninth Street, New York, has authorized construction of four industrial high schools in connection with 1930 school expansion program, including boys' voca-

tional school in Bronx to cost \$1,660,000; a similar continuation school in Bronx to cost \$1,100,000; boys' vocational school in Brooklyn to cost \$1,660,000, and continuation vocational school on Staten Island to cost \$1,100,000. W. C. Martin, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect for board.

American Radiator & Standard Sanitary Corporation, 40 West Fortieth Street, New York, has purchased Murray Radiator Corporation, 80 Lexington Avenue, manufacturer of copper radiators for commercial building service, for \$5,000,000 and will consolidate. Murray radiator units will be manufactured as heretofore; Thomas E. Murray, Jr., heretofore head of acquired organization, will continue with purchasing company.

New York Power & Light Corporation, State Street, Albany, N. Y., is planning hydroelectric generating plant on Hudson River, near Hadley, N. Y., to cost over \$3,000,000 with power dam and transmission lines. Company is planning to rebuild part of power plant at Glen Falls, N. Y., destroyed by fire April 9.

Pennsylvania Railroad Co., Pennsylvania Terminal, New York, has filed plans for new steel pier on Hudson River, near Exchange Place, Jersey City, N. J., two-stories, 160 ft. wide and 905 ft. high, to cost \$2,000,000 with traveling crane for loading, conveying machinery and other equipment. Unit will be known as Pier F, and will be first of three such structures to be built.

American Potash & Chemical Corporation, Woolworth Building, New York, will have plans drawn by United Engineers & Constructors, Inc., 112 North Broad Street, Philadelphia, engineer, for addition to potash and borax plant at Trona, San Bernardino County, Cal., including new power plant, to cost over \$3,500,000 with machinery.

Emil Prazak, 508 Monroe Avenue, Elizabeth, N. J., has filed plans for a two-story machine shop. William Clifford, 1177 East Grand Street, is architect.

General Alloy Co., 188 New Jersey Railroad Avenue, Newark, is considering early call for bids for two-story factory with boiler plant, to cost about \$45,000 with equipment. Paul B. West, 24 Commerce Street, is architect.

National Oil Products Co., Essex Street, Harrison, N. J., has asked bids on general contract for a four-story and basement addition, 60 x 85 ft., to cost over \$80,000 with equipment. Bishop & Scudder, 9 Clinton Street, Newark, are architects and engineers.

Charles Shilowitz, Journal Square, Jersey City, N. J., architect, has asked bids on general contract for an eight-story automobile service and garage building, 130 x 225 ft., to cost over \$300,000.

United Color & Pigment Co., Evergreen Avenue, Newark, has plans for a one-story addition, 42 x 60 ft., for grinding and other mechanical service, to cost about \$25,000 with equipment. Robert Bolton, 45 Branford Place, is architect.



## Buffalo

**B**UFFALO, April 14.—Jewell Steel & Malleable Co., 373 Hertel Avenue, Buffalo, has filed plans for two one-story additions for storage and distribution in foundry department.

O. D. May Mfg. Co., 31 Charles Street, Buffalo, manufacturer of butchers' equipment and supplies, has leased two-story factory at Lower Terrace and Henry Street for new new plant and will remove present works occupying part of former Curtiss aircraft plant on North Elmwood Avenue to new location and install additional equipment.

Corning Glass Works, Corning, N. Y., manufacturer of baking glassware, has awarded general contract to Rust Engineering Co., 606 Grant Street, Pittsburgh, for one-story addition, totaling about 25,000 sq. ft. floor space, including improvements in present works, to cost over \$100,000 with equipment.

Bronsteel Products, Inc., Buffalo, has been formed with capital of 200 shares of stock, no par value, to manufacture steel furniture specialties, and will take over and expand Bronsteel Equipment Co., 505 Delaware Avenue. James M. O'Neill, Jr., 81 Monticello Avenue, is interested in new organization.

All-American Mohawk Corporation, 4201 Belmont Avenue, Chicago, manufacturer of radio equipment, will remove plant to North Tonawanda, N. Y., where it will occupy part of factory of Rudolph Wurlitzer Co., manufacturer of pipe organs, etc. Production will be increased at new location. Sales department will be continued at Chicago.

James Wharmby, 114 Ridge Road, Rochester, N. Y., and associates have organized Flicker Signal Co., Inc., with capital of 6000 shares of stock, no par value, and will operate local plant for manufacture of electric automatic signal lights and devices. William H. Robinson, 204 Winbourne Road, is interested in new organization.

General Electric Co., Schenectady, N. Y., is arranging for a reorganization of Walker Dishwashing Corporation, 246 Walton Street, Syracuse, N. Y., manufacturer of electric-operated dishwashing machines, following recent purchase of controlling interest, and will increase production.

Buffalo office of Henry Prentiss & Co., Inc., New York, machine tools, has been moved to 1452 Hertel Avenue.

## Philadelphia

**P**HILADELPHIA, April 14.—Standard Oil Co. of Pennsylvania, Ledger Building, Philadelphia, has filed plans for a new compounding, storage and distributing plant at Pennypacker Avenue and Schuylkill River, to cost \$126,000 with equipment.

Grinnell Co., Inc., Providence, R. I., manufacturer of fire extinguishers, sprinkler systems, etc., has awarded general contract to United Engineers & Constructors, Inc., 211 North Broad Street, Philadelphia, for new factory branch and distributing plant at Philadelphia, to cost about \$150,000 with equipment. Philadelphia offices are in Commercial Trust Building.

City Council, Philadelphia, has closed negotiations with United States Shipping Board for purchase of Hog Island Shipyard for \$3,000,000, and under direction of Public Works Department will develop

site as municipal airport and kindred industrial service. Tract consists of 946 acres, of which 307 acres will be used for airport, including hangars, repair and reconditioning shops and other field units; 569 acres will be developed for a marine and rail terminal, with storage and distributing buildings provided with cranes, conveying and loading and other mechanical-handling facilities; 70 acres will be employed for establishment of seaplane base, with hangars, shops, etc. Entire project will cost about \$6,600,000 including equipment. It is planned to develop part of tract for leasing to industrial interests.

W. E. S. Dyer, Land Title Building, Philadelphia, consulting engineer and architect, has plans for new works at New Brunswick, N. J., to manufacture wire products, to cost about \$1,000,000 with equipment. Company name is temporarily withheld.

West Philadelphia Stock Yards Co., Thirtieth Street, Philadelphia, has revised plans for a six-story meat-packing plant to cost about \$1,000,000, including refrigerating machinery, conveying, elevating and other equipment. C. B. Comstock, 122 East Forty-second Street, New York, is architect and engineer.

Barbour Brothers, Marion Street and Pennsylvania Railroad, Trenton, N. J., iron and steel products, have begun construction of one-story addition, 72 x 143 ft., for steel fabricating shop, to cost about \$45,000 with equipment. Daniel A. Pulone, 249 Hamilton Avenue, is architect.

State Board of Education, State House, Trenton, N. J., has revised plans for two-story power plant, 48 x 58 ft., on Lake Boulevard, Ewing Township, and plans early call for new bids on general contract. Guilbert & Betelle, 20 Branford Place, Newark, N. J., are architects.

Lower Paxton Township School Board, Linglestown, Pa., plans early call for bids for one-story vocational training school, to cost about \$60,000. Kast & Kelker, 222 Market Street, Harrisburg, Pa., are architects.

## New England

**B**OSTON, April 14.—Machine tool dealers report business as virtually at a standstill. Prospects which a week ago gave indication of closing apparently are not yet ready to buy. New inquiries are light. Prompt or nearby delivery can now be made on a majority of equipment built in New England.

Sales of small tools aggregate fairly large each week, although individual orders are small.

United Electric Light Co., Springfield, Mass., closed bids last week on a one-story substation, 80 x 150 ft., to cost \$300,000 with equipment.

C. B. Cottrell's Sons, Westerly, R. I., printing presses, has started work on a two-story assembling plant. Lifting and conveying equipment will be bought.

Larkin & Carey Realty Co., New Haven, Conn., is about to start work on a one-story plant, 90 x 200 ft., for Crawford Oven Co.

Brockton Ice & Coal Co., Brockton, Mass., contemplates building a wood-working and blacksmith shop and will make other improvements.

City of Keene, N. H., has appropriated fund for a two-story and basement school addition, 36 x 72 ft., to contain manual training shops.

Lux Clock Co., Waterbury, Conn., has plans for four-story addition, 32 x 80 ft., to cost over \$75,000 with equipment. Thomas M. Freney and Henry T. Moeckle, Waterbury, are associate architects.

International Silver Co., State Street, Meriden, Conn., has plans for a one-story addition, 40 x 300 ft., to cost close to \$75,000 with equipment.

United States Rubber Co., Providence, R. I., is arranging for concentration of rubber tile flooring and rubber roll manufacture at local plant, and will equip two new factory units recently completed for such branches of hard rubber production. Present such factories at Chicago and Chelsea, Mass., will be removed to Providence. Headquarters are at Broadway and Fifty-eighth Street, New York.

Board of Education, Newton, Mass., will install vocational training department in new South Side junior high school on 11-acre tract at Rowena and Hereward Roads, including metal-working and wood-working shops, to cost over \$700,000, for which plans are being drawn by Henry & Richmond, 12 West Street, Boston, architects.

W. D. Cashin Co., 35 Hartford Street, Boston, manufacturer of boilers, tanks, etc., has plans for a one-story addition to cost about \$45,000 with equipment.

City Ice & Fuel Co., 6611 Euclid Avenue, Cleveland, is planning early construction of new ice-manufacturing plant at St. Albans, Vt., to cost over \$175,000 with machinery.

General Radio Co., 30 State Street, Cambridge, Mass., manufacturer of radio equipment and supplies, has awarded general contract to W. M. Bailey Co., 88 Broad Street, Boston, for four-story and basement addition, 50 x 100 ft., with extension, 20 x 24 ft., to cost about \$100,000 with equipment. Lockwood Greene Engineers, Inc., 24 Federal Street, Boston, is architect and engineer.

Hartford Clamp Co., Park Avenue, East Hartford, Conn., has awarded general contract to Sena Brothers, 737 Wethersfield Avenue, for one-story addition, 30 x 50 ft., to cost about \$20,000 with equipment.

## Pittsburgh

**P**ITTSBURGH, April 14.—The machine tool business in this district continues to show improvement, in both new inquiries and sales. Orders are still principally for single tools, but the total volume is satisfactory to most dealers. Sellers are particularly pleased with the way a number of buyers are releasing orders on equipment which has been held up for several months. The Westinghouse Electric & Mfg. Co. has been buying tools in the last week or two, after a lapse of several weeks, and other large industrial plants in the district have fair-sized inquiries before the trade.

Railroad buying is limited and largely disappointing. The Baltimore & Ohio is not expected to make any important purchases until after the railroad equipment builders' exhibition in Atlantic City in June, and other roads may also delay buying until that time. The Pennsylvania is planning construction of a large foundry at Altoona, Pa.

Formation of Bendix-Westinghouse Automotive Air Brake Co. was announced on April 11, following first meeting of directors of new company. Production will be carried on at Westinghouse Air Brake plant at Wilmerding, Pa. New company

is subsidiary of both Bendix Aviation Corporation, Chicago, and Westinghouse Air Brake Co. Vincent Bendix, president of Bendix Corporation, will be president of new company, and S. G. Down, vice-president of Westinghouse company, will be vice-president. W. J. Buettner, treasurer of Bendix corporation, is secretary-treasurer of new corporation, and R. M. Heinrichs, for five years attached to Bendix company, will be general manager, with headquarters at Pittsburgh.

Viking Metal Products Co., Jamestown, N. Y., E. T. Johnson, president, has asked bids on general contract for one-story plant at Ridgway, Pa., 120 x 275 ft., to cost over \$60,000 with equipment.

Indestruto Glass Corporation, 527 Fifth Avenue, New York, manufacturer of shatterproof glass for automobile and other service, with main plant at Farmingdale, L. I., is negotiating for purchase of plant of American Plate Glass Co., Kane, Pa., and plans establishment of main sheet glass plant at that place.

United States Gypsum Co., 300 West Adams Street, Chicago, has arranged for purchase of Northwestern Expanded Metal Co., with plants at Jeannette, Pa., and Chicago, manufacturer of expanded metal lath, and will operate as Northwestern Expanded Metal Division of United States Gypsum Co. Output will be increased.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has plans for one-story addition to branch plant at Trafford, Pa., 60 x 135 ft., to cost over \$75,000 with equipment. O. P. Hipple is company engineer, in charge of construction.

West Virginia Power & Transmission Co., West Penn Building, Pittsburgh, is considering construction of new hydro-electric generating plant on Cheat River watershed, W. Va., and hearing will be held by West Virginia Public Service Commission, Charleston, to approve project, to cost over \$1,500,000 with transmission system.

J. C. Armstrong, borough clerk, Etta, Pa., will receive bids until April 23 for a 1000 to 1250-kw. turbo-generator unit, with accessories, for municipal electric light and power plant. J. N. Chester Engineers, Clark Building, Pittsburgh, are engineers.

## South Atlantic

**B**ALTIMORE, April 14.—Western Electric Co., 195 Broadway, New York, manufacturer of telephone apparatus, radio equipment, cable, etc., has plans for another six-story unit at new plant in River View Park district, Baltimore, to cost over \$1,500,000 with equipment.

Hinde & Dauch Paper Co., Sandusky, Ohio, manufacturer of corrugated paper products, has acquired 5-acre tract at Baltimore for new mill. Plans will be drawn soon for initial unit for manufacture of corrugated shipping boxes and containers, to cost over \$75,000 with equipment.

Maryland Light & Power Co., Betterton, Md., recently organized to take over Betterton Ice & Electric Co. and other utility properties, has arranged for a bond issue of \$1,000,000, part of proceeds to be used for acquisition of electric light and power interests, including Home Electric Co., Lonaconing, Md., and Cecilton Electric Light & Power Co., Cecilton, Md., and for extensions in power plants and system, including transmission lines.

City Council, Norfolk, Va., is acquiring site of about 200 acres for municipal airport, and will have plans drawn for hangars, repair shops and other field

## The Crane Market

**T**HE volume of new inquiry for overhead traveling cranes has declined somewhat, but there is still a fair number of orders pending. M. W. Kellogg & Co., Jersey City, N. J., are inquiring for a small capacity overhead crane. The New England Power Association, Boston, has closed on two special gate hoists. The largest current inquiry, on which action is expected soon, is the list of cranes for the Anglo-Chilean Consolidated Nitrate Corporation, New York. The International Lead Refining Co., East Chicago, Ind., has closed on a 15-ton overhead crane with the Whiting Corporation.

Contractors continue to satisfy many of their crane and shovel requirements with used equipment, which is not difficult with a limited number of sizable contracts being awarded at present. The United Electric Light & Power Co., New York, has been asking for prices on a 25-ton crawl tread crane, for use at one of its large power stations. The New York Power & Light Corporation, Albany, N. Y., has purchased an electrically-operated crawl tread crane from the Orton Crane & Shovel Co. and E. R. Luedtke, Frankfort, Mich., a 20-ton steam-operated locomotive crane on skids to be mounted on a barge, also from the Orton Crane & Shovel Co.

units, to cost over \$100,000 with equipment.

Board of Directors, Samarcanand Manor, Samarcanand, N. C., is asking bids until April 28 for a steel water tank and tower, pumping machinery and other mechanical equipment for waterworks service. Plans and specifications at office of Bureau of Sanitary Engineering, North Carolina State Board of Health, Raleigh.

Board of District Commissioners, District Building, Washington, will receive bids until April 29 for sheet steel for automobile tags.

Frederick Thomas, 726 East Thirty-third Street, Baltimore, architect, has plans for two and three-story automobile service, repair and garage building, 115 x 200 ft., to cost about \$180,000 with equipment. H. F. Doeelman, Baltimore Trust Building, is engineer.

North American Button Mfg. Co., Howard and Palmer Streets, Philadelphia, has arranged for erection of one-story plant at McKenney, Va., totaling about 10,000 sq. ft., to be occupied under lease, and will establish branch works, to cost over \$50,000.

Columbus Electric & Power Co., Columbus, Ga., and affiliated companies are planning an expansion and improvement program to cost about \$1,350,000, including modernization and extensions in Columbus steam-operated electric generating plant, and installation of additional equipment; improvements and additions in generating station on Chatahoochee River, with new machinery. Extensions will be made in transmission lines and in several ice-manufacturing plants in southern part of State.

Virginia Electric & Power Co., Norfolk, Va., is planning extensions and improvements in car barns, with housing and repair facilities for motor buses, to cost about \$45,000. New car barn with repair department is under consideration.

Great Atlantic & Pacific Tea Co., 420 Lexington Avenue, New York, plans in-

stallation of conveying and elevating equipment, factory trucks, etc., in new four-story storage and distributing plant, 105 x 250 ft., at Atlanta, Ga., to cost \$200,000, for which general contract has been let to Flagler Co., Red Rock Building, Atlanta.

## Detroit

**D**ETROIT, April 14.—Parker Rust Proof Co., 2177 East Milwaukee Street, Detroit, manufacturer of rust-proof processes and equipment, has begun erection of addition to branch plant at Morenci to double present capacity, to cost over \$50,000 with equipment.

Island Lumber Co., Bay City, is planning rebuilding of mill on Island, in Saginaw River, destroyed by fire April 7 with loss estimated at \$60,000 including equipment.

Consumers Power Co., Jackson, has arranged for a bond issue of \$20,000,000, part of fund to be used for extensions and improvements in power plants and systems. In connection with expansion program at Grand Rapids, changing current frequency from 30 to 60 cycles, company has taken over former plant of Superior Foundry Co. and will establish plant for rewinding of motors to suit change in current and other industrial work. Plant will be operated by a subsidiary. Plans are being completed for new equipment and service building at Lansing, to cost about \$100,000, and a four-story headquarters and operating building at Pontiac will soon be placed under way, to cost over \$300,000. Stevens & Wood, Inc., 60 John Street, New York, is engineer for last-noted projects.

Square D Co., 6060 Rivard Street, Detroit, manufacturer of electrical switches and control equipment, is arranging for merger with Diamond Electrical Mfg. Co., 1320 East Sixteenth Street, Los Angeles, manufacturer of kindred products, with branch plant at San Francisco, and subsidiary, Diamond Electrical Mfg. Co. of Texas, Inc., operating a plant at Houston, Tex. Present factories will be continued in operation, and expansion carried out.

Board of Water Commissioners, 735 Randolph Street, Detroit, has plans for a machine shop, equipment storage and distributing plant, and garage building at Dearborn, for service at municipal waterworks, to cost \$175,000 with equipment. D. C. Grobbel is secretary.

Decker Screw Products Co., Albion, is carrying out expansion at plant, including installation of a new department for cadmium plating, to occupy larger portion of a one-story addition, now under way.

Kawneer Co., Niles, manufacturer of metal store fronts, copper and other sheet metal products, has purchased plant and business of Zouri Drawn Metals Co., Chicago Heights, Ill., and will operate as a subsidiary under Zouri name. Expansion will be carried out.

Board of Education, Flint, is planning installation of manual training equipment in two-story addition to Northern High School, to cost about \$600,000, for which plans are being drawn by Malcolmson, Higginbotham & Trout, 1219 Griswold Street, Detroit, architects.

National Smelting & Refining Co., 1842 Illinois Avenue, Detroit, has awarded general contract to Austin Co., Cleveland, for one-story addition for storage and distribution, to cost over \$50,000.



Detroit Power Shovel Co., 8751 Grand River Avenue, Detroit, has been incorporated to manufacture tractor-powered shovels and hydraulic industrial clutches. Tractor to be manufactured is of small  $\frac{3}{4}$ -yd. type, having a full-swing turntable with stationary engine mounted on other end of frame, thus enabling it to make an 8-ft. cut and at same time load a truck behind. W. E. Bernhard, president, is designer of hydraulic clutch control used on tractor. Company will be in production in 60 to 90 days.

Floor space devoted to manufacture of steel windows in Grand Boulevard plant of Detroit Steel Products Co., Detroit, has been increased 44 per cent this year. Introduction of two complete new lines of Fenestra steel windows necessitated expansion.

St. Louis Car Co., St. Louis, is low bidder at \$13,750 per car for 130 new street cars to be purchased by Joseph E. Millis, commissioner of purchases and supplies, Detroit.

## Cleveland

**CLEVELAND, April 14.**—Interest in the local machine tool market was centered during the week in the auction sale of 500 used tools comprising the equipment of the automobile plant of the F. B. Stearns Co., Cleveland. A large number of users, as well as dealers, attended the sale, many coming from considerable distance and representing diversified industries. Bidding was spirited and a large proportion of the tools brought high prices, users outbidding dealers, and, in many cases, because of competition among themselves, users purchased machines at much higher prices than dealers would have been willing to pay. Quite a few were purchased by the motor car industry. It is stated that the equipment brought close to \$250,000.

Sales were rather light in this territory the past week, but inquiry, mostly for single machines, shows improvement. Purchases included about a half dozen machines bought by the General Electric Co. for its Nela Park plant in Cleveland.

An order for 50 battery-driven electric industrial trucks for use in Boston has been booked by Elwell-Parker Electric Co., Cleveland, maker of industrial tractors and trucks. This is one of the largest contracts for industrial trucks placed in many years. A previous order for same number of trucks was placed with Elwell-Parker company in 1915 by Lehigh Valley Railroad.

Union Chain & Mfg. Co., Sandusky, Ohio, has appointed O. D. Tucker IV & Co., Little Rock, Ark., as distributor in Southwest for new Union silent timing chain. Tucker company operates branch offices in nine Southwestern cities.

McKay Structural Steel Co., Elderwood Avenue, East Cleveland, has plans for a one-story addition, 35 x 100 ft., to cost about \$45,000 with equipment.

Middle States Airport Service, Inc., Fulton Field, Akron, Ohio, has plans for new hangar, with repair and reconditioning facilities, to cost about \$70,000 with equipment. C. W. Frank, Akron Savings & Loan Building, is architect.

Peerless Motor Co., Quincy and East Ninety-third Streets, Cleveland, has secured exclusive patent rights for a European design front wheel-drive automobile, and plans to place unit in production soon, increasing manufacturing facilities.

Board of Education, Perrysburg, Ohio, plans installation of manual training equipment in new three-story high school to cost over \$200,000, for which plans are being drawn by Britsch & Munger, Nicholas Building, Toledo, Ohio, architects.

Prest-O-Lite Co., 30 East Forty-second Street, New York, manufacturer of acetylene gas equipment, welding apparatus, etc., a subsidiary of Union Carbide & Carbon Co., is planning new plant at Toledo, Ohio, to cost about \$200,000 with equipment.

Monarch Products Co., Tiffin, Ohio, has been formed with a capital of \$625,000 to take over and consolidate Monarch Mfg. Co., with local plant for manufacture of woodenware specialties, go-carts, etc., and Juvenile Products Co., Toledo, Ohio, manufacturer of children's vehicles, wagons, etc. Both plants will be continued and output increased at Tiffin works. Fred B. Cramer, Tiffin, is president of new organization.

Ohio Electric & Controller Co., 5900 Maurice Street, Cleveland, manufacturer of lifting magnets, motors, etc., has changed its name to Ohio Electric Mfg. Co.

## Cincinnati

**CINCINNATI, April 14.**—New bookings of district machine tool manufacturers the past week were on about the same level as those of the preceding week. Buyers are apparently withholding orders awaiting the upward trend of general business. Despite the reluctance to contract, users are constantly in the market for quotations on all types and sizes of tools; if only a small quantity of these inquiries are placed manufacturers will have a substantial amount of business. Production continues at less than normal, as plants are more dependent upon current bookings to sustain operations.

An unnamed automobile manufacturer has bought two large standard type lathes from a local manufacturer.

Refiners' Oil Co., Union Central Building, Cincinnati, has plans for storage and distributing plant to cost about \$100,000 with equipment. R. B. Clements, company offices, Dayton, Ohio, is company architect.

Crystal Tissue Co., Middletown, Ohio, has plans for addition to paper mill, to cost about \$100,000 with machinery. Schenck & Williams, Third National Bank Building, Dayton, Ohio, are architects.

Reynolds Metals Co., Louisville, has purchased Midland Metals Co., 1259 South Campbell Avenue, Chicago, manufacturer of tin foil, etc., and will consolidate. Operations will be continued at Chicago under name of Midland Foil Co.

Wabash Sanitary Co., Louisville, recently acquired by Louisville Enamel Products Co., with local plant, and operated as a subsidiary, has awarded general contract to J. F. Russell, Brook and Bloom Streets, for two-story plant to manufacture enameled iron products, including table tops, furniture specialties, etc. D. X. Murphy & Brother, Louisville Trust Building, are architects.

Louisville Taxicab & Transfer Co., Ninth and Liberty Streets, Louisville, has awarded general contract to J. F. Russell & Co., Brook and Bloom Streets, for a multi-story automobile service, repair and garage building, to cost \$120,000. D. X. Murphy & Brother, Louisville Trust Building, are architects.

Board of Trustees, Ohio Soldiers' and Sailors' Orphans Home, Xenia, Ohio, has

asked bids on general contract for two-story vocational training school at institution, H-shaped, 78 x 120 x 32 ft., to cost about \$85,000. Robert S. Harsh & Associates, 122 East Broad Street, Columbus, Ohio, are architects.

Ohmer Fare Register Co., Dayton, Ohio, manufacturer of taximeters, fare registers, etc., has leased about 10,000 sq. ft. in building at 1009-11 West Washington Street, Chicago, and will remodel for factory branch and distributing plant.

## Chicago

**CHICAGO, April 14.**—Sales in this market continue in fair volume, but new inquiries are less frequent. The impression is growing among local dealers that the peak in spring demand for machine tools has been reached and that the trend from now on to the summer will be downward. It is also thought that a revival in buying may take place earlier than usual, possibly in mid-August. Of special interest are purchases by the Nash Motors Co. for its Milwaukee plant and plans now being prepared for betterments at its Racine works. Among important sales the past week was a Putnam billet gouger to the Inland Steel Co.

The Santa Fe and the Milwaukee road continue to place orders against lists and it is reported that the latter railroad still contemplates buying for its car shops. The Northern Pacific is putting out occasional inquiries and the Chicago & North Western will buy a 50-in. and a 20-in. drill. Union Pacific will soon issue a list and Grigsby-Grunow Co., Chicago, is preparing to enter the market.

Joslyn Mfg. & Supply Co., 120 South La Salle Street, Chicago, manufacturer of bolts, insulators and kindred small iron and steel specialties, has asked bids on general contract for a one-story shop addition, to cost about \$40,000 with equipment. Abel-Howe Co., 53 West Jackson Boulevard, is engineer.

Department of Purchases and Construction, Springfield, Ill., is planning early call for bids for steam power plant at Lincoln, Ill., to cost about \$70,000 with equipment. State Division of Architecture and Engineering, Capitol Building, Springfield, is architect and engineer.

Baker Ice Machine Co., 3601 North Sixteenth Street, Omaha, Neb., manufacturer of ice-making machinery, parts, etc., has secured property at Humboldt, Iowa, and contemplates a factory branch at that place.

Board of Education, Granite Falls, Minn., is considering installation of manual training equipment in high ad grade school to cost about \$230,000, for which plans will be drawn by Jacobson & Jacobson, 123 East Grant Street, Minneapolis, Minn., architects.

Empire Auto Body Building Co., 624 West Twenty-sixth Street, Chicago, manufacturer of automobile bodies, has leased three-story factory at 2601-9 Archer Avenue, 75 x 100 ft., with option to purchase, and will remove to that location, providing additional equipment for increased capacity.

Commonwealth Edison Co., 72 West Adams Street, Chicago, has begun work on two and three-story addition to equipment storage, distributing, repair and service plant at Twenty-second and Thropp Streets, with foundations to carry five additional floors later, to cost about \$900,000, of which equipment installation will represent about \$400,000. Nimmons, Carr &

Wright, 333 North Michigan Avenue, are architects. Company has plans for three new power substations to cost over \$3,500,000 with equipment.

Jefferson Electric Co., 1500 Laflin Street, Chicago, manufacturer of transformers, fuses and other electrical specialties, has organized a Canadian subsidiary and plans early establishment of new branch plant at Toronto, to cost over \$70,000 with equipment.

Otter Tail Power Co., Fergus Falls, Minn., is considering construction of steam-operated electric generating plant at Langdon, N. D., to cost about \$120,000 with equipment. It is also planned to extend transmission lines in that section.

F. I. Salter Co., Lonsdale Building, Duluth, Min., has awarded general contract to Alfred Fredstrom, Arlington Avenue, for one-story machine shop, 25 x 100 ft., to cost about \$23,000 with equipment. Gillison & Ellingsen, Torrey Building, are architects.

## Milwaukee

**MILWAUKEE**, April 14.—Moderate activity continues in the machine tool market, but conditions are spotty.

Payroll of Allis-Chalmers Mfg. Co. has reached 9400 in the aggregate, which is 200 more than company had at work at wartime peak. A. O. Smith Corporation, while not yet at the 1929 peak, has added nearly 1000 within a month and is employing 6370 at present, with prospects for further additions to the force.

Milwaukee Cut Stone Co., Milwaukee, a new organization headed by Leonard Schmidt, 5557 Thirty-seventh Street, has plans by Edward M. Kleser, engineer, 1325 First Street, local, for a new plant, 80 x 100 ft., to cost about \$50,000. A complete new equipment of motor-driven chipping, cutting and polishing tools will be purchased.

Bids close May 2 with E. G. Doudna, secretary, State Board of Normal School Regents, Madison, Wis., for new boiler plant equipment for State Teachers' College, Superior, Wis., including three 150-hp. boilers with furnace or stokers and accessories; two Simplex boiler feed pumps; two vacuum pumps, and one steam jet ash conveyor and storage tank.

Marathon Paper Mills, Rothschild, Wis., has placed general contract with Roy J. Murphy Construction Co., Ashland, Wis., for an addition, 100 x 125 ft., at Ashland plant.

Marathon Rubber Products Co., Wausau, Wis., has broken ground for a manufacturing, shipping and storage addition, 62 x 126 ft., part two stories and basement.

Wisconsin Fuel & Light Co., 1007 Chicago Avenue, Manitowoc, Wis., has plans for a coal-gas plant, work on which will begin as soon as a water-gas plant now being erected is completed and placed in service. Thomas Danely is general manager.

Froedtert Grain & Malting Co., Milwaukee, is awarding contracts this week for 18 additional grain tanks at its main elevator at Thirty-third Avenue and Grant Street. Present operating machinery, conveyor equipment, loaders, etc., will be increased about 50 per cent.

Strauss Electric Appliance Co., Waukesha, Wis., has been incorporated by Norbert F. Strauss, 904 Hadley Street, Milwaukee, to develop business established in Milwaukee five years ago to manufacture

electric domestic and industrial water heaters. Present works will be moved to Waukesha and undergo material enlargement in association with Universal Milking Machine Co. of that city. Mr. Strauss is president of new corporation.

## Gulf States

**BIRMINGHAM**, April 14.—Board of Trustees, Dallas Vocational School, Dallas, Tex., has changed name of institution to Southwest Vocational School, to serve larger district in State. Superstructure will begin on initial unit, one story, 75 x 200 ft., with two wing extensions, 75 x 100 ft., on 20-acre tract at Oak Cliff, to cost over \$125,000. Other units will soon be built, entire program to cost about \$500,000 with equipment. T. E. Jackson is chairman of board.

Canulette Shipbuilding Co., Slidell, La., is planning erection of new drydock at shipyard, with construction and repair facilities, to cost close to \$100,000.

Board of Directors, Aberdeen Chamber of Commerce, Aberdeen, Miss., is planning construction of municipal airport, including hangars, repair shop and other field units, to cost close to \$50,000 with equipment. M. M. Mims is secretary.

Central Power & Light Co., Frost National Bank Building, San Antonio, Tex., has plans for one-story ice-manufacturing plant at Woodsboro, Tex., to cost over \$45,000 with machinery. John M. Marriott, address noted, is company engineer.

H. D. Foote Lumber Co., Alexandria, La., is planning electrically-operated planing mill to replace a plant recently destroyed by fire, to cost over \$40,000 with equipment. Company is operating temporarily at local mill of R. O. Martin Lumber Co.

Firestone Tire & Rubber Co., Akron, Ohio, is arranging for factory branch and distributing plant at Corsicana, Tex., to cost over \$50,000 with equipment.

Texas Power & Light Co., Dallas, Tex., is disposing of a bond issue of \$4,000,000, part of fund to be used for extensions and improvements in power plants and system.

Board of Education, Dallas, Tex., has awarded general contract to Christy-Dolph Construction Co., Dallas, for first unit of new technical high school, to cost over \$250,000 with equipment.

Continental Petroleum Corporation, Ponca City, Okla., is planning new oil storage and distributing plant at Dallas, Tex., to cost more than \$90,000 with equipment, including tanks, pumping machinery, etc. Plant will be operated under direction of Holland-Martin Oil Co., Dallas, local representative.

Wichita Mill & Elevator Co., Wichita Falls, Tex., has work under way on addition to grain elevator, to include installation of conveying, elevating and other mechanical-handling equipment, to cost over \$300,000.

Texon Oil & Gas Co., operated by Texon Oil & Land Co., Big Lake, Tex., has applied for permission to construct and operate a carbon black manufacturing plant in Reagan County, where company is operating oil properties, to include installation of battery of air compressors and other mechanical equipment, to cost \$85,000 with machinery.

Orleans Parish School Board, New Orleans, plans installation of manual

training equipment in new four-story Alcee Fortier High School, for which general contract has just been let to R. P. Farnsworth & Co., Maritime Building, to cost over \$675,000 with equipment. E. A. Christy is supervising architect for board.

Houston Lighting & Power Co., Houston, Tex., has work under way on expansion at Deepwater steam-operated electric power plant to increase output to 150,000 kw. Extensions will be made in transmission lines. Entire project will cost over \$500,000.

## St. Louis

**ST. LOUIS**, April 14.—Firestone Tire & Rubber Co., Akron, Ohio, has awarded general contract to Miller-Stauch Construction Co., Railway Exchange Building, Kansas City, Mo., for two-story factory branch and distributing plant at Kansas City, to cost about \$100,000 with equipment.

Fairfax Airports, Inc., Security Building, Kansas City, Mo., will soon begin construction of one and two-story hangar at Rosecrans Field, St. Joseph, Mo., 40 x 115 ft., with repair and reconditioning facilities, to cost about \$50,000. Walter Boschen, Tootle-Lacy Building, St. Joseph, is architect.

Barnsdall Corporation, Okmulgee, Okla., has begun an expansion and improvement program at local oil refinery, to develop capacity of about 7000 bbl. daily, including gasoline output. Project will cost over \$150,000.

City Council, Sikeston, Mo., has been authorized to arrange bond issue of \$150,000 for installation of municipal electric light and power plant and system.

Wheatley Brothers Brass Foundry & Machine Works, Inc., North Owasso Street, Tulsa, Okla., has awarded general contract to Howard & DeWitt, 257 West Twelfth Street, for one-story addition, 85 x 166 ft., to cost about \$65,000 with machinery.

Oklahoma Natural Gas Corporation, 112 North Broadway, Tulsa, Okla., is planning early construction of new pipe line from Quinton field district to connection with main system, to cost over \$500,000 with compression stations and equipment.

Board of Directors, Flanagan's Boys Home, West Dodge Street, Omaha, Neb., is planning one-story machine shop unit and power house, to cost about \$60,000 with equipment.

International Harvester Co., 606 South Michigan Avenue, Chicago, has asked bids on general contract for a new factory branch and distributing plant at Grand Island, Neb., to cost over \$80,000 with equipment.

El Dorado Foundry, Machine & Supply Co., El Dorado, Ark., recently organized, will take over and consolidate El Dorado Foundry & Machine Co., and Ellis Iron Works, both with local plants, and will specialize in production of oil-well machinery and supplies, saw and planing mill machinery and parts.

Wichita Public Elevator Co., Wichita, Kan., Samuel Wallingford, head, plans addition to grain elevator, including battery of 20 tanks, with conveying, elevating and other mechanical equipment.

St. Louis office of Allegheny Steel Co., Brackenridge, Pa., H. G. Brautigan, local manager, has been moved from Shell Building to 803 Missouri Pacific Building.



## Indiana

**I**NDIANAPOLIS, April 14.—Time-O-Stat Control Co., McNaughton Avenue and Myrtle Street, Elkhart, manufacturer of electrical control equipment and devices, has awarded general contract to George C. Kistner & Son, 514 South Main Street, for one-story addition, 60 x 250 ft., to cost over \$75,000 with equipment.

Indestructible Wheel Works, Inc., Lebanon, manufacturer of automobile wheels, etc., has purchased plant and business of Bimel Wheel & Spoke Co., Portland, manufacturer of kindred products. Acquired business will be removed to Lebanon and consolidated with purchasing organization. Expansion will be carried out at Lebanon for increased production of steel disk motor car wheels and other wheel products. L. C. Willis is president of Indestructible company.

Marion Machine, Foundry & Supply Co., Marion, has plans for two-story addition to cost about \$100,000, and will soon take bids on general contract. Hiram Elder, Custer Building, is architect.

Board of Education, Hammond, is considering installation of manual training equipment in new two-story and basement junior high and grade school in Franklin West Park district, to cost \$350,000 with equipment. Louis C. Hess, First Trust Building, is architect.

Eastern Indiana Gas Co., Newcastle, operating natural gas properties, has acquired Central Fuel Co., operating similar system at Rushville, with group of 78 producing gas wells, pipe lines, etc., and will consolidate. Expansion is planned in Rushville section, including installation of additional pipe lines.

Nehi Bottling Co., 100 West Frank Street, Evansville, has awarded general contract to Kanzler & Son, Furniture Building, for one-story bottling plant, to cost about \$50,000 with equipment.

## Pacific Coast

**S**AN FRANCISCO, April 10.—West Coast Separator Co., 1880 West Slauson Avenue, Los Angeles, manufacturer of storage battery separators, etc., has plans for a one-story addition, 55 x 160 ft., to cost about \$35,000 with equipment. William J. Moran, 324 West Forty-eight Street, is architect.

Southern California Edison Co., Los Angeles, is arranging an expansion and improvement program in local district to cost about \$10,000,000, of which about \$2,500,000 will be expended for wire and cable and \$1,000,000 for poles, fittings, line equipment, etc. In other districts, company will expend about \$13,000,000 for generating station extensions and improvements, transmission lines, power substations and other facilities.

Rose International Chemical Co., 330 East Channel Street, Stockton, Cal., is planning new one-story plant, to cost about \$100,000 with equipment.

Soule Steel Co., Army and Mississippi Streets, San Francisco, has plans for a one-story addition, to cost about \$25,000 with equipment.

Consolidated Orange Growers, Orange, Cal., has plans for a new pre-cooling plant, three stories, 80 x 90 ft., with ice-manufacturing division, to cost \$125,000 with machinery. Ice-manufacturing equipment will cost about \$50,000 of total noted.

Holly Sugar Corporation, Colorado Springs, Colo., is considering construction of new beet sugar refinery at Stockton, Cal., with power house, machine shop and

other mechanical buildings, to cost \$600,000 with equipment. It is understood that project will be carried out and plant operated by Franklin Sugar Co., Preston, Idaho, a subsidiary.

Union Oil Co., Mills Building, San Francisco, and Seattle, has plans for a new oil storage and distributing plant at Edmonds, Wash., to cost over \$150,000 with equipment.

United States Aircraft Corporation, San Francisco, has been organized to take over and expand Marchetti Motor Patents, Inc., Russ Building, including airplane manufacturing plant, airport and other properties near Mills Field. Company has also acquired plant and business of Malley-Long Furniture Mfg. Co., 2900 Mariposa Street, and will utilize this plant for production of wooden parts for aircraft wings and fuselages. Company is arranging a bond issue of \$200,000, part of fund to be used for expansion. It is understood that Paul Marchetti, heretofore head of Marchetti Patents organization, will be identified with new company.

City Council, Fallon, Nev., is considering municipal electric light and power plant, to cost about \$100,000 with machinery.

## Foreign

**F**OLLOWING completion of new steam-operated electric generating plant at Stourport, England, soon to be placed in service, Shropshire, Worcestershire & Staffordshire Electric Power Co., Stourport, a subsidiary of Utilities Power & Light Corporation, 327 South LaSalle Street, Chicago, is planning construction of four additional such plants in neighboring locations during next 48 months, each to have a capacity of about 100,000 kw., to cost about \$10,000,000 with transmission lines, switching and power substations. Entire project in period noted will total \$40,000,000. J. N. Canavan is vice-president in charge of operation of parent organization.

Metropolitan Water, Sewerage and Drainage Board, Sydney, New South Wales, Australia, is disposing of a bond issue in United States of \$7,500,000, proceeds to be used in part for extensions and improvements in water, sewer and drainage works, including installation of electric power equipment, pumping machinery, pipe lines, conveying and other mechanical equipment.

Libby, McNeill & Libby, Union Stock Yards, Chicago, canner and packer of food products, has acquired former condensed milk factory of Cleve Brothers, Ltd., Limerick, Ireland, and plans establishment of new canning plant at that place, with adjoining factory for meat-packing, including automatic canning and sealing machinery, conveying and other mechanical equipment.

Berlin City Electric Co., Berlin, Germany, is arranging for sale of stock issue in United States to total about \$15,000,000, part of fund to be used for extensions and improvements in power plants, transmission lines and distributing systems.

National Ministry of Public Works, Madrid, Spain, is arranging a call for bids for construction of first section of wharf at Cadiz, for Board of Port Works at that place, to cost 868,508 pesetas (about \$113,000), project to include mechanical handling and loading equipment, conveying machinery, etc.

Tubize Co., Ghent, Belgium, is planning expansion in production facilities for viscose and acetate rayon specialties, and

will install equipment to increase pulp output from 4½ to 8½ tons a day. A new viscose producing unit will be built, to cost over \$500,000 with machinery.

## Canada

**T**ORONTO, April 14.—Officials of Page Hersey Tubes, Ltd., Church Street, Toronto, have announced that company will build a plant at Welland, Ont., to manufacture seamless steel tubes. New works will have a capacity of 50,000 tons of tubes a year and will cost \$2,000,000.

Bids will be received until April 18 by H. G. Acres & Co., Ltd., Ferry Street, Niagara Falls, Ont., for a power house and filtration plant for Niagara Falls Water Commission, to cost \$500,000.

Ross-Meagher, Ltd., Laurentian Building, Ottawa, Ont., has been awarded contract for construction of a waterworks and filtration plant at Ottawa. Gore, Nasmith & Storrie, Confederation Life Building, Toronto, are engineers.

Bids will be received by G. A. Reid, mayor, Belleville, Ont., until April 23, for construction of water purification plant, including pumps, motors, etc. E. T. Austin is waterworks engineer.

### Western Canada

E. H. Shockley, 230 Central Avenue, Vancouver, B. C., has been awarded contract for a paper mill, 135 x 250 ft., at foot of Raymur Avenue, Vancouver, for Pacific Mills, Ltd., Standard Bank Building. W. G. Swan, Birks Building, is engineer.

W. T. Whiteway, architect, Dominion Building, Vancouver, B. C., has plans for erection of a plant for Vancouver Trunk & Bag, Ltd., 1424 Charles Street, to cost \$50,000.

### New Trade Publications

**Steel Shelving.**—Universal Fixture Corporation, 135 West Twenty-third Street, New York. An illustrated folder, 8½ x 11 in., describing shelving for warehouses and stockrooms, offered in 42 sizes, with uprights punched on 2-in. centers to permit extreme flexibility in arranging distances between shelves.

**Production Welders.**—Thomson-Gibb Electric Welding Co., Bay City, Mich. Folder describing typical standard machines for welding by the resistance method—spot welders, seam welders, butt welders and welding presses, and the engineering service behind each sale.

**Steel Cross Ties.**—Carnegie Steel Co., Pittsburgh. Booklet of 38 pages, dealing with various styles of ties for steam, electric and industrial railroads. Photographic views of railroad track show ties in use. Table gives rates of annuity for redemption on used ties.

**Lift Trucks, Trailers, etc.**—Western Pipe & Steel Co., 608 South Dearborn Street, Chicago. Pamphlet illustrating and describing in 31 pages several types of lift trucks, dollies, steel platforms, trailers, etc., for handling bulky or heavy merchandise.

**Steel Belt Conveyors.**—Sandvik Conveyor Mfg. Co., Inc., 21-23 Amsterdam Street, Newark, N. J. Catalog 30 of 84 pages is devoted to various types of equipment and parts used in connection with steel belt conveyors for in-

## The Week's News Quickly Told

### Current Events That Bear on the Course of Business

**N**AVAL agreement has been reached by America, England and Japan on all categories of naval vessels. Total tonnage for the next six years will be 1,140,000 tons for the first two powers and 800,000 for Japan. This compares favorably with the 1,500,000-ton basis, for which Great Britain held out at the Geneva conference. Great Britain, France and Italy are to continue efforts to harmonize viewpoints regarding security in the Mediterranean.

**W**ORLD WAR has cost the United States 37.5 billion dollars to date, according to the Treasury Department, and before the debt is extinguished 14 billion more will be spent for interest and pensions.

**B**USINESS still halts, with conflicting trends. March clearing house returns from 190 cities showed the first improvement since October. Commodity index is also slightly firmer. On the other hand bankruptcies in March were the highest for any March since 1922. Industrial failures were specially heavy in the East. Most of the bank failures were in the Central and Southern States.

**E**MPLOYMENT in the State of New York at last shows an upturn. Unofficial figures from census takers in the metropolitan area show that about 6 per cent of the workers are idle. Julius Barnes said that the two principal obstacles to continued industrial expansion in America are seasonal and technological unemployment.

**R**AILROAD income, while only 9 or 10 per cent less in gross earnings, has been about 28 per cent less in net since November (as compared month by month to previous year). Interstate Commerce Commission has authorized Chesapeake & Ohio to acquire and operate the Hocking Valley Railroad, thus recog-

nizing a majority stock ownership existing since 1910. Coal traffic on the latter is to be stimulated by construction of extensive docks at Toledo, Ohio.

**I**NLAND WATERWAYS CORPORATION, operating government barge lines on the Warrior and Upper Mississippi rivers, had a deficit of \$350,000, and handled 2,114,000 tons of freight in 1929. New York Legislature passes constitutional amendment (subject to referendum) authorizing transfer of ownership and operation of barge canal to the United States for use as national waterway between the Great Lakes and Atlantic.

**F**ORD MOTOR CO., after losses of \$114,000,000 in 1927-28, earned \$82,000,000 last year on the production of 1,850,000 Model A cars. The company, owned entirely by Henry Ford, wife and son, has a surplus of \$664,000,000. Special taxes levied against motor car owners by the various States amounted to \$767,000,000 in 1929, almost all of which is spent on the construction and maintenance of roads.

**A**VIATION CORPORATION OF DELAWARE, which operates 11 of the 25 domestic mail routes and whose planes fly 20,000 miles each day, lost \$700,000 during the last nine months of 1929. This deficit is charged mostly against passenger transport. C. A. Lindbergh said that a glider has such a slight element of risk it will be widely used as a training machine.

**T**ELEVISION, in the form of a two-way interchange of sight and voice, known as the ikonophone to H. E. Ives, of Bell Telephone Laboratories, the inventor, was demonstrated. The image is black and white on a pinkish background, much superior in detail to older

forms, and the combined sending and receiving booth is illuminated with a mild bluish light. Control of Fox film and theater enterprises is bought by H. L. Clarke of Chicago, president of a midwestern utility corporation, thus ending financial difficulties and receivership suits.

**G**RAIN stabilization has left the Federal Farm Board with so much wheat that it has appealed to millers to loan vacant elevator space. Wheat prices have increased about 16c. during the last month. Condition of the winter crop is reported to be somewhat below par. Brazil has definitely abandoned the coffee valorization scheme, after some years of effort.

**T**OKIO stock exchange was temporarily closed to avert further drastic declines in stock quotations. Japanese business is in distress because America is buying less raw silk, India is buying less cotton goods, and the low silver price has sharply depreciated the value of accounts payable by China.

**E**LECTRICAL systems in England, now largely municipal projects, are being consolidated into a super-power "grid" by Central Electricity Board. The work will take 10 years and \$1,500,000,000 to complete, but rates for power from the completed grid will be about 2c. per kwhr. Lessened employment has produced a deficit of \$73,000,000 in the English exchequer. Receipts from postage stamps and beer taxes were sharply decreased, and the doles largely increased. A commission of engineers and economists has reported that twin railroad tunnels under the English Channel are feasible from an engineering standpoint, and would cost about \$150,000,000, but it is doubtful whether sufficient traffic would be developed to warrant rates equivalent to those now charged by steamships.

dustrial use. Installation charts and tables of dimensions are included.

**Boiler Water Conditioning.**—Hagan Corporation, Pittsburgh. Booklet of 30 pages, devoted to a scientific treatise on Hagan phosphate, a new, molecularly dehydrated boiler water conditioning chemical. The discoveries and development step by step of this new chemical for the prevention of scale, corrosion and foaming in steam boilers are dealt with.

**Ash Conveyor.**—United Conveyor Corporation, Chicago. Four-page folder dealing with the Nuveyor pneumatic ash conveyor used in handling ashes, soot, coal, and all dry, granular, abrasive materials. Said to be applicable to power plants handling 5 to 100 tons of ashes a day.

**Roller-Bearing Trolley.**—Robbins & Myers, Inc., Springfield, Ohio. Bulletin 5025 illustrates and describes, in eight pages, new Ace trolley in both plain and geared types, along with prices on the entire line.

**Graphic Instruments.**—Roller-Smith Co., 233 Broadway, New York. Bulletin 830 deals with both a.c. and d.c. graphic instruments, made in switchboard, wall and portable models, also as ammeters, voltmeters, single and polyphase wattmeters and power factor meters. List prices are given.

**Diamond Substitutes.**—Haynes Stellite Co., Kokomo, Ind. Section D of loose leaf catalog describes the use of Haynes Stellite for hard facing rock drilling tools, the applications and properties of Haystellite, cast tungsten

carbide inset pieces, to be welded to steel bits with Hascrome rod and overlaid with Stellite.

**Lathes.**—South Bend Lathe Works, South Bend, Ind. General catalog No. 91-A, 108 pages, two colors. The 96 sizes and types of the new model precision lathes, with tools and attachments, are described and illustrated. Included are the 24-in. large swing lathe, recently brought out, and the precision metric lathe built to cut International and French Standard metric screw threads of standard pitches. The catalog contains data relating to lathe construction and selection for various classes of work, as well as export information in the English, Spanish, Portuguese, French and German languages.



